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Atari Users

Issue 25 £1

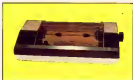
January/February

INCLUDING STAGE FOR ST USERS



SHOGI

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1029 EVERYTHING
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ALWAYS
WANTED!

DISKS HOW THEY STORE
ALL THAT DATA

PAGE FLIPPING

REVIEWS - SILENT SERVICE - NINJA - SCREAMING WINGS
- QUESTPROBE and MANY MORE

"The magazine for the dedicated Atari user"

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PAGE 6 is a user magazine which
also caters to readers' support in
submitting articles and programs.
The aim is to explore ATARI
computing through the exchange of
advice and knowledge. We will
endeavour to pay for articles and
programs where appropriate and we
hope that readers will enjoy seeing
their work published. In any case
we hope that our readers will benefit
from the articles and programs
submitted and receive their
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January/February 1987

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THE NEW ATARI?

As most of you will know by now there has been a change of top management at Atari in the UK with Bob Glendon (appointed as UK Managing Director and another in command) soon as Sales Manager. Bob Glendon was the man who was strongly considered to be taking over in the UK when Jack Truesdell thought Atari had a severe headless a/cid, as we all know, Atari thrived on it each the same way as always. Nobody was seriously alarmed, despite the presence of the ST, that Atari has achieved the position in the UK that we all hoped for when Jack Truesdell took over. There have been many changes of management over the years at Atari and each time everybody involved with supporting Atari has thought "Is this it? Are we now going to see some real advertising and a push to get Atari into an rightful place in the UK?" It never has happened and those who have been selling and supporting Atari over the past five or six years have tended to become a little sad. "What is happening this time?" Who knows, but early signs are encouraging. Atari were usually not going to attend the recent Atari Christmas Show but changed their minds when Bob Glendon took over and we actually received a phone call from someone at Atari offering "remanagement" and wanting to know more about us. Just past our fourth birthday and someone at the top of Atari knew we were! It is evident that the new man wants to know what is going on in the Atari world and is anxious to find out what support there is which is the first step to success. Let us hope this time that this really is it.

1025 PRINTER

Okay 1025 printer owners, this is the issue you have been waiting for. I have mentioned before that we had some material for the 1025 and I had planned to run it over several issues but have decided instead to put all the more useful stuff in this one issue for easy reference. I was going to do a long article on the 1025 myself but having got hold of one it has to be acknowledged that it is a very basic printer, and quite honestly the manual does cover everything the printer can do. All it needs is someone with a little programming experience to expand upon the manual. Here you have it. Turn to the section on the 1025 and enjoy!

ANNUAL READERS POLL

As we now are able to pay for most of our contributions I had thought about dropping the Readers Poll but it has proved invaluable in the past so we have continued it and can always double as a survey. Instead of the small prizes for winning contributions for all the past years prizes the winners will be hand-picked to enjoy an experience of the shades given by the readers. Maybe next year we will extend the idea a little to have an annual PACS & Atari's concourse for everyone who has supported Atari! For now, please vote and please also use the survey to let us know what you would like to see in the magazine. Tell us about the areas you feel we have not yet covered and we will do our best to bring them to you.

MORE CONTRIBUTIONS

Following on from the above, I need to make my minimum plea for more contributions, especially of programs. We are running short of top class programs of all kinds but particularly games. There must be more out there just dying to get into print so please send them in. The more documentation and written detail you can provide the better the chance of being accepted, but don't let lack of documentation stop you, send them in anyway! We have had a few problems coping with everything during the last year, what with three magazines, money issues and a lot more heads and some contributors have not had their submissions acknowledged. For that I apologise but I revere your understanding and hope that you will keep them coming. We have now got ourselves straightened out now and things will improve. I promise! Only if you send in some great programs and articles though!

Leo Ellington

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WSA & ACCESS WELCOME

CAN YOU COPE?

If all these late nights at the computer are getting too much for you then Mind Link Communications Inc. might have just the product to allow you to relax while still processing totally addicted to your Atari!

The Canadian based company have released **THE MIND TUNER** for all 8-bit Atari, a unique program that claims to help manage stress and to improve personality and performance using proven psychological principles. It is not a game but an attempt to use the computer seriously in a beneficial way. The program comes with a 42 page book explaining the principles and how to apply them and what's more they guarantee results!

If you are interested you can get more details from Mind Link Communications Inc. Box 489, 34, Adelaide Street E., Toronto, Ontario, Canada, M5C 2J6. The program costs \$24.95 US plus shipping.

LOOK OUT FOR ...

Some new compilations from US Gold on cassette at £9.99. Two collections entitled *Short 'Em Up* featuring Sugar Zaxxon, Dropzone, Blue Max 2001 and Fero Apocalyptic and Scott Adams' *Scrooge* with *Voodoo Circle*, *Strange Odyssey*, *Barbarian Bonzo* and *Prince Adventure*. By the way did you know that *Adventure International* had gone into liquidation? It looks though as if their titles may survive in other guises.

ROBICO PROMISE

The Robico adventure **RICK HANSON** should be with you now and it is claimed to give Level 9 a run for their money! In a recent Awards ceremony in A & B Computing magazine, Rick Hanson was voted Best Electronic Adventure, Best Tape Based BBC Adventure (jointly with *Warms in Paradise*) and Robico's *Enthar Server* was voted Best Overall Adventure.

Improved versions are promised for the XL/XE as it looks as if adventures are in for a treat!

TRIVIAL PURSUIT

The wild faraway game comes at last to your computer and you now have the chance to contribute towards another yacht in the Bahamas for the winners! Denmark have the computer rights and as well as the German Edition have more

brought out a Young Players Edition available as a separate game for the XL/XE at £14.95 on cassette and £19.95 on disk. Do you know how many hours *Tweezer Pie* has in its head? Your Atari will now know the answer.

News

MINORITY INTERESTS

For those interested in the more esoteric side of computing such as amateur television or robots, a new magazine called **SIGNEW'S** recently came our way. Issue 2 has only eight pages but is full of the sort of information you don't normally see published. They are looking for more contributions on any minority interests. If you are interested drop a line to Glenn Lester, 145, Richmond Road, Leytonstone, London, E11 4BT for more details.

Those interested deeply in Adventures might like to subscribe to *Adventure Contact* run by Pat Wintourley at 13, Hollingden Way, Wigton, WY1 6LS. Their excellent little newsletter features little for the Atari but will be interesting for those deeply hooked on adventures. It is aimed primarily at those who write, or want to write, their own adventures.

XLENT SOFTWARE COMES TO THE UK

XLENT Software, who have produced some excellent utilities for Atari such as *Megalith*, now have a UK company to bring their products to the European market. XLENT Software (UK) is headed by Mike Reynolds-Jones also Managing Director of Software Express although the two companies are totally separate. Initial releases will be for the ST but XLENT's amazing 4-bit products will also be released together with new products including a low price word processor which has received very favourable comments in the States.

One of the aims of the UK company is to concentrate on software that is genuinely useful and that will allow Atari owners to use their computers in more productive ways. New products will only be announced when release dates are known as the company's directors feel that too many products have been announced in the past by other companies which never reach the market. This serves only to frustrate users and readers alike who seldom know what to believe. Three products for the ST have been announced (see ST News section) and other titles will be announced throughout the coming year.

Readers Write

ULTIMA IV PROBLEMS?

Dear Les,

It would appear that early copies of Ultima IV distributed by US GOLD in this country are faulty. If you can NEVER tell ANY enemy at all then it is because you have a bad copy. US Gold have notified the problem and will replace your copy if you send it to them (their address is on the packaging). If you know how to write bad vectors then you can fix it yourself by writing bad vectors into the 4th month track. Check that it is full of bad vectors first though!

There is also some doubt about the copies of QUEST TROUS. If you find that it drops into BASIC when you come out of a dungeon then please let US Gold know on 021 580 1580 so that they can make down the problem.

John Incebery

PRINTER DRIVERS

Dear PAGE 6,

Could you please send me details of your public domain software collection. I am most interested in a printer driver mainly because I don't know what it is!

Frederic Paget,
Belgium

Details are on line only. In our other readers you provided a printer driver as a program that acts as an interpreter between a word processor or other program and a specific printer. If your printer does general features such as bold, italics, graphics etc then they may be accessed easily by using a printer driver designed for that printer. Most word processors have printer drivers for the most popular printers both in use, a few programs do not. Essentially what happens is that the program uses a code for special functions, and looking for

example may use CTRL U. The program will attempt to CTRL U but not all printers use the same code for underlining. The printer driver checks such characters and to the printer and substitutes some other or 'instructs' character such as CTRL-U if a printer it will otherwise not your printer knows. The way it is possible for a particular program to work with every printer by simply adding or using different printer drivers.

WISHING BBS

Dear Sam,

I was wondering if it would be possible for you to help me. I am trying to set up a BBS for Atari users. I know that at the present you have maintained other BBS's and would be most grateful if you could mention more in one of your columns.

It is called Wishing, runs at 560 560 (V.21) and can be reached by dialling 01 484 1268 between the hours of 10.00-08.00 7 days a week. It will be named mainly at Atari.

KEEP WRITING!

Dear PAGE 6,

I am sure that there are a great deal of Atari owners who do not name or remember have left a bit of interest of their friends who own other machines. Every month new games are released by British companies for the Commodore and Spectrum but the software houses rarely do a version for the Atari.

I see that a lot of budget titles have reappeared in the shops after an Atari conversion has been made which seems points that there is a market for Atari software if only the companies would bring out Atari versions. Should a convention of Atari will be the Atari but why stop there? Why don't they do the Commodore and Spectrum and Pageboy to well. Surely there are not many

owners to keep them, get positions started, or just let them die as each other.

Have you ever thought of having a BBS list in each of your zones, with a list of current systems that are online? This seems to be a growing area of interest for Atari owners.

Your help would be most appreciated and keep up the excellent work you do in PAGE 6.

Marie Wybild,
Hessley, Kent

The problem with printing details of BBS's and the like is keeping it up to date. I have no idea for a moment' how and how which could list all BBS's. Our Group and reader regarding Atari. To read it separate all these concerned to provide me with details and for readers to let me know if they find any online get out of date. If you want to get the full version and run a BBS or User Group you should write a sheet of paper already headed ALSO USCE and send them to me. BT

Circle and PLUS 4's then Atari?

The point I am trying to make is that Atari owners should write or telephone these companies and ask it, or rather when the Atari version of the game is coming out. It is so good writing back and making for someone else to ask otherwise nothing will happen. If every PAGE 6 reader wrote or rang up, I am sure that more companies would be doing conversions. If you don't know where to write here are some suggestions:

Opera Software, Ocean House, 4, Central Street, Manchester, M2 3NS. Tel: 061 847 6612. Games include: March Day, Daisy Thompson, Moon Over Olympus. Caplaxia Software Ltd., Alpha House, 15, Carver Street, Sheffield, S1 4PS. Tel: 0942 733423. Games include:

HACKER PROBLEMS?

Dear Les,

I purchased a copy of Hacker on tape and completed it last week. I think that there is a part of the game missing as the computer tries to load something else on the wall. When I reach Washington with the document the game tells you to press RETURN to see someone's headline. The computer then loops and the tape starts up but the screen just goes blank and the tape runs to the end.

I returned my copy to Acornsoft for replacement but the same thing happens. Can any of your readers help? Is it the same on all copies or am I just unlucky?

Paul Cole,
Waltham, London



Atari 400 and Plus 4's then Atari?

Elite Systems Ltd., Anchor House, Anchor Road, Abingdon, Oxford, OX14 3JL. Tel: 0493 244441. Games include: Chess and Golden Commando, Popoetry and Roundyart. Melbourne House (Publishing) Ltd., Melbourne House, 68, High Street, Hampton Wick, Middlesex-Uxbridge. Tel: 01 893 2012. Games include: Exploding Fire, The Hobbit, Slugs and Pin 2. Imagos Software (UK) Ltd., Address the same as Coast but use Coast House. Tel: 061 839 2029. Games include: Galaxion, Ocean Brawl and The Air King Po.

Design Design Software, 115, Newbury Road, Chesham Mill, Slough, Berkshire, RG2 7NS. Games include: Nectar, Dash Bar and

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FAMILY THIES

Dear Les,

My wife and I are compiling a family tree. As you can imagine we have accumulated a mass of information which is all in notebooks and on scraps of paper. To try and bring some order to it and present it in an easily accessible form we want to convert it into a disk. We are in contact with Home Office Manager but it is not really satisfactory. Since you have so much information it becomes difficult to present it in a way that makes it easy to follow through.

Is there a program available on disk which specifically for genealogy or a program more adaptable for this use?

Tony Bates
Lymington, Hants

The **ANTIC GENMAG** is a program called The Family Tree created by Merry Jones which may be available from

your local vendor or Software Express in Birmingham. The program is limited to 8 generations and up to 24 generations can be saved on one disk. There is another program available on America by post only that do have the disks somewhere but could not find them in time for this issue and also a program operating in genealogy. Try writing to Genealogy Company, 3162 Jennings Dr., Fairfax, VA 22031, U.S.A. and they may be able to provide further help. If any **PRINTS** is reader have serious programs for genealogy we can provide further information. I would be interested to hear.

PRINTSHOP AND 1029

Dear Les,

You may have noticed that there were three plans for help in using the 1029 with Printshop in a recent **COMDEX** column. I think that there is more than enough interest to warrant the printing of an

article in the magazine. I am already going to purchase a 1029 printer and Printshop and want to be sure they work.

I will also be buying a word processor. Can you tell me if SuperScript supports microspacing and if PaperKey has any definable keys?

Garth Morris,
Dulles

The 1029 will not work with Printshop. I doubt whether a 1029 printer driver will ever be produced for it as the 1029 was never sold in the States and Printshop is a program which, primarily, a U.S. market. I regard word processing. I would fully agree that if you are interested in such applications as microspacing, you get a much better printer than the 1029. SuperScript does not support microspacing but PaperKey does providing your printer is capable of it. PaperKey does have very definable keys. I must say that they are not as powerful as SuperScript.

Mall Of The Things

All these companies have produced some great games, you think how much better they would be on an Atari! The Atari has the best graphics so we should have the best software too you don't get what you don't ask for.

All it will cost you to ask is a few pence.

Neil Wallace
Wandsworth, London

This letter arrived BEFORE John Dunsen's letter so the first time was published as it seems that there are many Atari owners who feel strongly about this. Show how you feel by getting out that pen and paper or writing a call. This is an award!

BOUNCING BERT

Animation with page flipping

by Allan Knopp

The designers of the Atari range have given us a very flexible system. Graphics subroutines are particularly well catered for, and if there is one way that computer graphics are an experimental area, pixel and page flip is the ability to create a new page picture.

There are several ways in which it is possible to create movement, or at least the illusion of movement, with the Atari. One method is page flipping. Not simply, page flipping consists of drawing all your graphics across an memory chunk simultaneously and then showing three screens one after another. Any one of the screens can be displayed, and because it is already in existence in memory there is absolutely no delay between pictures as there would be if the screen had to be drawn each time.

Page flipping is possible because the Atari has two pointers to access memory. One of these pointers tells the Atari to take its display information from a particular section of memory. This is the pointer to "read memory". The other pointer tells the Atari which area of memory is to be written to if anything is typed, or a PEEK or DRAWTO command is issued. This is the pointer to "write memory". Normally both of these pointers direct the Atari to the same area of memory, so that whenever it writes it simultaneously displays. It is possible however to change both of these pointers from BASIC, so all that is necessary when setting up page flipping is to set the pointer to "write memory" to the same address as it does in a selected area of memory.

When each screen is complete, move the pointer to another area of memory and draw the next screen. Carry on with this until you have all your screens stored, then by using the pointer to "read memory" with the same value that was used when one of the previously saved screens was drawn, that screen will be instantly displayed. So you can see, in this way it is possible to store a series of screens (not like a series of frames in a film) and by displaying them in sequence, full screen animation can be achieved.

THREE BASIC STEPS

There are three basic steps to implementing page flipping:

1. Because that the screens are positioned in memory so that they will not be overwritten by the program. Firstly reserve an area of memory. To do this first find the top of available memory by peaking location 100. Then POKE this with a value lower than the usual value which tells the system how thinking that the top of free memory is lower than it actually is. The screen can be safely stored above this location. The amount of memory which needs to be reserved depends on the number of screens you wish to store and the graphics mode (see Table 1). The higher resolution modes use a lot more memory for the screen display.

As an example the following:

```
RAMTOP = PEEK(100) POKE 104, RAMTOP-4
```

reserves four 256 byte pages (1K) of memory which is sufficient for one Graphics 0 screen.

2. Change the address of "read memory" before the screen is drawn. This pointer is contained in memory locations 80 and 81, usually it is only necessary to change the value in location 80. If you have peked location 104 with RAMTOP-4 as in step 1, then the command POKE 80, RAMTOP-4 will cause the screen to start immediately in memory.

3. Moving stored screens, to display it just change the pointer to "read memory". This pointer is contained in the fourth and fifth bytes of the display list. First find the start of the display list with the command DL = PEEK(160) + 256*PEEK(161). Then DL + 4 and DL + 5 will contain the pointer. You will only usually need to alter the value in DL + 5. All that is now needed is to peke DL + 5 with the same value that was peked into location 80 when the screen was drawn, and the screen will appear. In this case that is done with the command POKE DL + 5, RAMTOP-4.



TABLE 1

GRAPHICS MODE	PAGES REQUIRED PER SCREEN	MAX NO OF SCREENS
0 and 1	4	25
2 and 3	2	50
4	6	15
5	52	4
6 to 11	32	3

The number of screens which can be stored depends on the amount of RAM and the length of the program but the maximum available with 32K(71 bytes) of free RAM is shown in the table.

BRING ON BURT!

Now that I have described the general principle of page flipping, I think it might be useful to see how it works in practice.

Program 1 demonstrates scenarios by page flipping. There are a total of eight screens which are displayed on a random sequence. Because of the memory requirements of the higher resolution modes the screens in this program are drawn using a redefined character set in Atari mode 4, which gives the main mode (as in Graphics 7) by one more line memory. In Graphics 7 it is only possible to have a maximum of four screens, whereas with Atari 4, which is essentially the same in terms of memory requirement as Graphics 8, it is possible to have thirty-one screens should you require them.

When the program is run it will prompt you to get a cassette containing music from your Atari program recorder and press PLAY. When installation is completed the music will play through the television speaker, causing the screens which were previously stored to flip, thus causing the picture. I have not blanked out the screen during an installation so that you can see each screen as it is drawn. Initially you will only see the blocks of characters which will be redisplayed later by the routine which starts at line 335. The first screen is displayed while the character set is redefined.

Before each screen is drawn the program GOSUB's to line 305. Lines 305 to 307 set up an Atari mode 4 screen. Line 308 sets aside an area of memory where the screen can be stored. This is done as previously described, with a pointer to location 108. Location 108 is added to the initial value of RAMTOP (which is increased to line 175) minus TX, which is initially set to 4, and then increased by 4 each time a screen is drawn. In this way we are saving inside 4 pages each time a screen is drawn. Line 309 tells the Atari to draw the screen in the area of memory we have just set aside, by pointing to location 89 in the RAMTOP-TX. Thus, so that we can see each screen as it is drawn, we also point DL + 5 to the RAMTOP-TX thus telling the Atari to display that same section of memory.

When all the screens are done and the character set is installed the program goes to the loop starting at line 140. Lines 140 and 143 set the variable DANCE to a random multiple of 4 within the range 4 to 36. Then DL + 5 is pointed with the value RAMTOP - DANCE so lines 159 and 160, telling the Atari to display that area of memory selected by the pointer in location 89 at line 325.

RAPID TRANSITION

When the program is running you can see how rapid is the transition between one screen and the next. Clearly page flipping is a very powerful technique and with a little thought and planning some dynamic screen displays can be created. One point to remember is that if screen memory crosses a 4K boundary then the screen display will be disturbed. This is only a problem with the higher resolution graphics modes, but if you want to flip screens as Graphics 8, 9, 10, or 11 then you'll need a program 1, which flips between two Graphics 8 screens. You will see from the listing how the address of free memory is also set at DL + 104 to point to the area of memory which is displayed on the bottom half of the screen. When the screen is drawn, press START or SELECT to

```

00 1 000 *****
00 2 000 *****
00 3 000 *****
00 4 000 *****
00 5 000 *****
00 6 000 *****
00 7 000 *****
00 8 000 *****
00 9 000 *****
00 10 000 *****
00 11 000 *****
00 12 000 *****
00 13 000 *****
00 14 000 *****
00 15 000 *****
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GO-FORTH AND MULTI-TASK

Hignose Software S.E.C.S.
£24.99

Unlike the so-called ST series, there is a very limited choice of languages available for the older 8-bit Atari computers. Indeed, the main alternative to using the slow and unimproved BASIC is to resort to the complexities of Assembly — an unattractive choice!

Although considerable interest has been shown in the Dutch language, and introductory articles have appeared in most computer magazines, it is surprising that so few programmers appear to have been converted to it. Dutch does not seem, of course, and I would agree that it does take some effort to become familiar with its multi-based operators and the reverse Polish notation, but it is a fast, powerful language, and, once learnt, most users become Fortb enthusiasts if not addicts.

Most versions of Fortb available for the Atari 8-bit computers in Britain have had some weaknesses or have been rather expensive. Go-Forth is a multi-tasking version, requiring a minimum of 30K RAM, produced and marketed in the UK by S I C S Ltd under licence from the equally named Hignose Software. It is approved by Atari, claimed to provide features normally only found on standard main-frame computers, and is on sale at a very reasonable price (£25). To see if this represents good value, we must look at the features provided.

First, I should perhaps remind you that a Fortb system consists of a dictionary of compiled words. A word is similar to a sub-routine, it carries out a particular function, and several may be combined together and given a descriptive name to define a more complex function. You can receive any function simply by entering its name from the keyboard. The language is usually provided in the form of a Fortb monitor, which is the part that runs the computer on booting up, from the disk supplied, and several 'libraries', that is, sets of definitions of words you may choose to add to the monitor in order to carry out specific tasks. The libraries are stored on the disk as sections or blocks which can either be read into buffers in the computer for inspection and modification, or compiled directly into the dictionary.

The one I've provided in Go-Forth differs reasonably closely the Fortb-79 standard, so if you copy code obeying this standard from another source into your system, it should compile without serious difficulties. The differences from the 79 standard are listed in the User Guide provided. The only one which might cause problems is the absence of the variable STATE, which answers whether the system should compile or execute immediately the code presented as it. There are ways round this, but you need to know exactly what you are doing.

The libraries include not only two editors. I found the screen editor, which behaves rather like a BOX editor, particularly effective for entering new definitions. The less subtle is of the conceptual type: Fortb lines, and were added to the modification of existing screens. The block size in Go-Forth is 512 bytes, so each screen consists of 32 lines of 32 characters. It is more usual to have a block size of 1024



reviewed by Peter Coates

bytes (16 lines of 64 characters), but the smaller size has more efficiency on the Atari disk system.

If you are accustomed to 8000 machine code, you should have few problems with any Fortb assembly, since you have adapted to the reverse notation. In fact, because high level control words such as IF ELSE THEN and REPEAT UNTIL are available, and you can break the code into small sections, each of which can be tested and debugged separately, assembly in Fortb is actually rather easy. The Go-Forth assembler does not, however, make use of the check digits normally included to ensure that the control words are correctly paired. In my opinion, this is a definite weakness, the time saved while loading in material, and errors to be avoided by this occurred in checking the code and finding the mistakes.

The debugging utilities allow you Fortb words to be checked by stepping through the definition, walk the contents of the work and any important variables shows after each step. There is much more useful facility than the de-compiling utility currently provided, which merely lists the words present in the definition. It would have saved me many hours of frustration and waste of paper in the past.

The main-making mistake are perhaps the more serious than that of Go-Forth, and it's unusual to find these features on an 8-bit source. Some tools are provided, one (TYPIST) enables you to continue using the computer while printing out long documents or listings. Another (TICKER) gives a digital clock on the GR II text screen, and supplements other time and date resources available. Whether you find the ability to run simultaneous tasks to be of great value depends very much on your applications. It is particularly useful for controlling external equipment — a sophisticated domestic control and heating alarm system, for example.

Other features cover disk and ED operations, and sound and graphics. There is the whole conventional set of facilities available in BASIC. No attempt has been made to provide words to cover player-mouse graphics and display list operations.

On the whole the package is neatly and efficiently done. There are some minor points I don't like, for example, the disk drives are, for no good reason, numbered five, 3 rather

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from the usual 1 to 4. Also, no missing in print if you enter a word with the same name as our sticky process. This can be corrected by re-creating CREATE, but I feel that a warning should be the default option. There are no floating point routines, although the price might claim that they are available in Forts, which predominantly uses integer and fixed point arithmetic, I have found them very useful on occasion.

The one version failing in *On-Forts* is the documentation provided. The reader is assumed to be a competent Forts programmer experienced in the use of a standard M68 assembly language. A very small fraction of the potential customer will meet these requirements. Even if you do, the 96-page user guide is not well written or well organized, and some sections are fairly going astray. It also has no fair share of errors, even the procedure on page 2 for backing up the system disk is badly (and more) than has been replaced by a dagger symbol. For a beginner, a copy of *Brooks's Learning Forts* or of *Wheatfield's The Complete Forts* is absolutely essential. These will cover the requirements, of course, and not the features specific to *On-Forts*.

To sum up, then, I would say that this is a very good version of *Forts for the Atari*, with some really useful extensions, even if you do not make much use of the multi-tasking aspects. There are a few things which need correcting, and the documentation could be much improved, if you are a newcomer to Forts, you will certainly need an introductory text to get started. The price is very reasonable, and represents excellent value for money.

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16. GRUDS IN SPACE

They spin disks! Do your space suits and check your oxygen tanks. This issue we're going for a trip around the solar system in our case, but TED's illustrated Adventure with a space theme.

The first in Gruds in Space "This is a collector's item which deserves to be a classic and is featured that way because of a request from a reader. The second is Powerstar. This has the unusual claim to fame of being the first and only Atari Adventure that has ever been released on cartridge — although I consider it more an example of "state-of-the-art" than a "new".

Anyway, loosen your seat belts and get ready. Set blaster!

GRUDS IN SPACE

Gruds in Space follows the traditional format of the disk-based (then card) Adventure. It was written by Clark Jennings and Jim Diller and released by Sierra Software. If these names are unfamiliar to you, then there is probably a good reason for it: appears that Gruds in Space was originally written for the Apple II since the authors lack of time in the Atari world and postponed for the Atari's launch over two years ago. It only had a limited exposure before Sierra Software's team cut off business connections around November 1981. When that happened, all Sierra Software's programs instantly disappeared from the marketplace.

I tried to buy a copy of Gruds in Space (number Sierra Adventure), but without success. If anybody has a copy I'd love to hear from you! Fortunately, I was more successful with Gruds in Space and found it discussed and order home in the U.S. that still had a copy.

Gruds in Space turned out to be an excellent game in every aspect and had not suffered in the transition from the Apple II since gave a few extra games on the market. It's a top game with lots of rooms, several clever traps in the early ones, a nice blend of ray and hard puzzle and game physics. The graphics include simple atmospheric-looking eyes, flashing lights and glowing stars in a dark starry scene. I realize it's a very nice game and for if you will ever have seen it, but if you ever see a copy, BUY IT! You won't be disappointed.

YOUR OWN SPACESHIP

The game itself starts aboard the planetary shield spaceship USAC 9800. And you're the pilot! The one catches all you very late about the game, but this is offset by a message received in the opening screen.

— This is an urgent message to the pilot of the vessel USAC 9800 from USAC Command on Earth. Our

and POWERSTAR

helicopters, at the rear base near Saturn, have exhausted their fuel supply. The only cargo ship capable of returning to the fuel base also ran out and is now stranded on Pluto. The last Helicopter, is only available on Saturn. We believe that your ship is the only one in the solar system that can carry the fuel from Saturn to Pluto in time to prevent the defeat of our force. We know that once your ship is properly armed, you cannot be ordered to accept the mission. We are prepared to reward you the sum of one million dollars on the completion of the mission. —

If you accept the mission, you may get your fuel shot off. If you don't accept, you might as well remove the disk and turn the computer off (but what's it to do)? One million dollars may sound like a fortune to the pilot of a primary ground spacecraft, but it's better than nothing (and that's all you're getting in the mission). Obviously, you decide to land the Saturn.

Placing your spacecraft is remarkably simple. You just set the navigation coordinates and let the computer wait the map drive do the rest. The computer will tell you which you arrive and you can verify that by simply checking the navigation screen or looking out the window. You can then set the target coordinates and it goes down to the surface of the planet.

You will be just a couple of miles of traveling throughout the game. It's essential that you get the coordinates right or you'll end up floating in free space — where death is just a few seconds away. It's suggested you draw up a table to record the navigation coordinates and interpret coordinates of each destination as they are revealed to you during the game.

ENTER THE GRUDS

When you arrive at the enemy camp on Saturn, you'll want to have a good look around. In doing so, you'll discover two things. Firstly, much of the enemy camp is inaccessible to you for one reason or another. Secondly, the mission isn't far from hopeless. You see, Saturn is infested by Gruds and if there's one sure thing a Grud does, it's a burrow. Before continuing, I should explain that a Grud is a short, fat alien with yellow-green skin, fuchsia and big ears. It was used as a company mascot because kept its all Sierra products and

by Garry Francis

appeared in several of these games. For example, if you've played *The Blade of Blackpool*, you may remember the slot of a *Grid* on the island in the lake.

If you expect to progress very far, you'll have to find a *Grid* who's willing to help you. Maybe one that's rich. One whose greed for money is stronger than his dislike of humans. One who has a brother!

You'll soon learn that *Grids* are not unlike humans. If you want information, you'll have to pay for it! In this case, your currency are wasted money, not your money. You'll have to deliver a coin to someone on Venus and return with a corresponding machine. Sounds simple enough, but it turns out to be more than you bargained for.

By the time you return to Saturn, you should have collected enough items to allow further exploration of the wrong camp, including a trip into the oven and a trip beyond the locked gate to search of the *Arks*. The *Arks* is a strange character. Your first conversation with him will probably be a useless one, but he's really quite nice! You need only do him a favor to gain his confidence. A trip to the *Arks*'s temple should put you on the right track.

At around this point, you'll be ready to visit the somewhat alien ship which is orbiting Venus. In order to fully explore this ship, you'll have to solve a real brain buster of a puzzle. This one's a beauty. I could best describe it as the sort of puzzle that you'd expect to find in *Talbot's Book of Enchanting Critiques*.

Over back in Saturn, you may manage to find the fuel, but in doing so you create another trail to the wrong line. This one sends another trip to Venus, then to Earth. If all goes well, you'll have the pleasure of blowing up a *Barrack* ship before eventually delivering the fuel to Pluto. Then it's back to Earth for a million dollars and a pat on the back for a job well done. Where?

HINTS

Guided hints for *Grids in Space* are included with this article. To use the hints, just look for the area where you're stuck, and match the number with the accompanying list of words to create a line. If you're still having trouble, you'll find a full solution in "The Book of *Adventure Games*" by Kim Salvance (Avary, Inc.).

POWERSTAR

Technically speaking, *Powerstar* is one of the most intricate *Adventure* ever to come along in a long time. *Parsons Software* have managed to create the whole *Adventure* into a *Mac* version! The biggest advantages of this are that it is simple to use (no need to mope about with backups of copy protected disks), it boots instantly and there are no long-by-games-for-disk-space during the game. The biggest disadvantages are that the graphics are terrible and the vocabulary is too limited to allow for an enjoyable game.

Powerstar uses a split screen format with graphics at the top and text at the bottom. The graphics data for the various rooms has been compressed (to save memory) by defining individual elements such as tables, chairs, beds, windows, grates, robes, etc. In this way, a room can be drawn by (a) starting with an empty room and adding a table, two chairs and a window at pre-defined positions. Each room is made to look unique by using different combinations of the individual elements and using different colours.

The graphics appear to be done as *GRAPHICS 18*. This allows up-to-nine colours on the screen (without displaying too many), but because of its odd-shaped pixel, the pictures look rather "blocky". As the colours are very good, I'd have preferred to see fewer colours and better resolution, but that's just my picking. It has no effect on the play of the game.

The text is Amer's default colour on boring blue. This always has a negative effect, but there are other options that are more exciting. The text is allocated to a much larger area than is necessary (about half the screen) and is cleared after every row. In addition, the program's vocabulary is too unlimited. Placing the game becomes a frustrating exercise in guessing the right word, rather than solving puzzles. In fact, in almost three years of testing this column, this is the first game that I've finished and haven't actually finished! And I blame it on the poor vocabulary. More about this later. The only point I'll emphasize here is that it doesn't matter how technically innovative a game is if it's so fun to play!

ABOARD THE POWERSTAR

Five years takes place in the 21st century when all electrical power in the U.S. is generated by a single nuclear reactor aboard an orbiting space station called *Powerstar* (it seems that the *Powerstar*'s one man crew has had a bad bout of cabin fever). The only message from him in the last week was a fax of the label from a bottle of Jack Daniels. As the alternate engine for the *Powerstar*, it is your job to save the space station from this and before he dies any damage.

The *Adventure* begins at a government field station somewhere on the U.S. coastline. Your opening words create on the airfield behind you, but it won't start without the key. While you're searching for the key, you might as well have a good look around to see if there's anything else of interest. Movement is achieved using the traditional M, S, E and W, but you can also use the cursor keys or even a joystick! As you move about, you'll discover that each room generally has four views - one for each of the cardinal compass directions. Thus the first rule for the successful completion of *Powerstar* is to make sure that you view 360 degrees in every room! If you don't, you'll very likely miss something!

Once you've collected all your goodies from the field station, you can take to the stars in your spacey blimping air ship to a real party. It's like a maze, but the four pictures for each room really add to the confusion. Read the room descriptions very carefully and you'll get that they're all unique. Your opening screen shows about 100000 but without the correct fuel, but that'll be no problem if you remembered to fill 'er up before you took off. This GUESS number, didn't you?

Once in orbit, you'll find yourself in an orbit round. The text you see is generated only by you and have no distinguishing features to guide you. In previous *DES* mapplets and before long you'll find yourself in the docking bay of the *Powerstar*.

THE ADVENTURE BEGINS

Here is where the real *Adventure* begins. If you can get out of the landing bay and if you can pass the various doors and other obstacles, and if you can map the whole

ness, you'll find that the Powerator is a miniature version of the classic saucer-shaped space cruiser made famous by Stanley Kubrick's "2001: A Space Odyssey." Imagine it as a spindly wheel. The docking bay is the hub at the center of the wheel. Nearly any ladder extending down the spokes to the rim of the wheel. If you continue heading south (or north) around the rim, you will eventually arrive back where you started from. Keep this in mind when planning your trip.

The space station is full of obstacles to prevent you finding your way around. As you gradually overcome these obstacles, more and more of the station will become accessible to you. When you find the television console, a face flashes up on the screen and a voice beams out from a loudspeaker: "I now have control of the space station. The nuclear reactor will be destroyed. There is nothing you can do to stop it. Go back to your ship and go away now."

Oh boy, as though you weren't having enough trouble, now you have to find a bomb to set off! If you tussle with it, you'll eventually find the bomb and if you're particularly clever, you'll also discover a way to destroy it without destroying the space station. Before you can celebrate your success, another loudspeaker comes to life: "I have left the station as a shuttle. You have failed to stop me. I set the main reactor controls and the nuclear console will now ramp and blow the Powerator out of the sky." Amazing! The funny business always seems to be one step ahead. What now?

You discover that the console has dropped an article during her flight. On the back of the article is the word **AMUZING**. Hints.

BACK TO EARTH

At this point, I was stumped. I decided to fly back to Earth and discovered that I was able to enter a previously inaccessible room. This turned out to be the emergency control room of the Powerator. On the control panel was a keyboard. When I pressed it on, the spaceship came to life and a voice said: "Enter password." The only thing I'd encountered that resembled a password was **AMUZING**, but no matter how I expressed it, the program would not respond. Talk about frustrated! I blamed the program's poor vocabulary for this, but maybe that's not the problem. Was I on the right track? Is **AMUZING** the password? Have I done something wrong somewhere? Would someone please help me out?

HINTS

It would be unfair of me to try and supply hints for a game that I haven't finished as I might tell you the wrong thing. My apologies to anyone who is disappointed by this. If you're really desperate, I feature a hint sheet for **Powerator** is available from Packard Software at the address at the bottom of this page.

COMING UP

I recently finished **Asylum**, but then I had a **TRUCE** game that I think I'll save it for the next **Adventure Special** issue. This should give you all plenty of time to try and solve it for yourselves. In the meantime, I'd like a bit of feedback on a question of ethics. I'd like to publish the map for **Asylum**. Do you think this is the right thing to do or is it unethical? Please let me know when you can.

Next issue, I may take a look at one or two **Adventures** from Level 5, but then again I might not. It all depends on what comes up between now and then.

If you have any special requests, questions, comments, etc., please feel free to contact me at the address below. However, if you expect a reply to your letters, please include a couple of international reply coupons to cover the return postage. Merry Christmas to you all and may Santa bring you some brand new **Adventures** for the New Year.

Gerry Francis, 26 Baraga Road, Enfield, N 5 W 1204, Australia.

Gerry Francis' ADVENTURE HINTS

GRUDS IN SPACE

Inventory

1. One long pole
2. 100000

3. 100000

4. 100000

5. 100000

6. 100000

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Steve Padler discovers just how all that data is stored on your disks

DISKS

Although knowledge of the structure of files stored on disk is not necessary in order to use a disk drive, the subject is an interesting one and information about it is essential if you wish to carry out various tasks such as repairing damaged files or creating boot programs. The following article examines the structure of various types of disk file, and in the second part of the article I will present a sector editor enabling you to directly read and write to disk sectors.

All references to DOS and disk drives in the article refer to the current 8086 standard of 1000 drives and DOS 2.1, unless stated otherwise.

THE DISK ITSELF.

A floppy disk consists of a thin, circular piece of plastic coated with metal oxides which store the data in magnetic form. As a magnet is applied the disk is not usable, and the surface must first be organized into tracks, by a process known as formatting. The surface of a formatted disk is



divided into 40 concentric tracks. Each track is in turn divided into 18 (single density) or 24 (enhanced density) sectors, each of which holds 128 bytes of data. Data is therefore packed rather more closely onto an enhanced density disk, which means that the disk surface must be of higher quality to prevent reliable storage. In fact, the only difference between disks designated by the manufacturers as single or double density is that one has been tested for higher quality. Prior to formatting the drive cannot distinguish between them. If a computer is to use a quality disk as formatting a disk designated as single density with DOS option 1 will almost surely result in an enhanced density format, which might lead to unreliable data storage. To specifically format a disk as single density, use DOS option F.

Once the disk is formatted, the BIOS (but not the HD) drive can distinguish between single and enhanced density and use the disk accordingly. The HD drive can use a single density disk formatted on a DOS, but not an enhanced density one. Note that DOS 2.05 can read an enhanced density disk in a DOS drive, but sectors numbered 730 or greater are invisible to it and files using these sectors will be unavailable.

SECTOR NUMBERS

From the figures above you will see that theoretically a single density disk contains 720 sectors (40 tracks * 18 sectors per track = 720 sectors) and an enhanced density disk contains 1440 sectors. Examination of a freshly formatted disk (not containing DOS files) shows however that you only have 717 or 1437 free sectors respectively. What happened to all those missing sectors?

On a single density disk, as part of the format process, eight sectors (360-368) are reserved for the disk directory and a further sector (369) for the Volume Table of Contents (VTOC). The structure and use of these sectors is described below. These seven sectors (1-7) are reserved for the DOS file manager boot file (see below). Finally, one sector is lost due a discrepancy between the original version of DOS and the original disk drives. As far as the drive is concerned, the 720 sectors on the disk are numbered from 1 to 720, but DOS numbers them from 0-719. The result is that sector 720 just does not exist as far as DOS is concerned. No doubt this could have been rectified with later versions of DOS, but then there would have been a loss of compatibility between the various versions. Anyway, this makes a total of 15 unavailable sectors, leaving 707 free for use. (Note that these sectors are only unavailable within the confines of DOS - you can use any of them in any way you like by bypassing DOS and doing direct sector-oriented disk access.)

Although 1440 sectors are present on an enhanced density disk, due to the file link structure DOS 2.5 cannot use sector numbers greater than 6553. The reason for this will become apparent when discussing linked sector files below. Of the 1410 sectors available, 12 are reserved for the directory, VTOC, and DOS boot file as above. Although seven sectors numbered 730 or above can be used by DOS 2.5, in certain minimum compatibility mode DOS 2.05 cannot read or write to them. This leaves 1410 sectors free for use.

THE DIRECTORY

The directory consists of eight sectors starting at sector 361. These were chosen because they are in the middle of a single density disk and therefore give the shortest average disk access time. Each directory entry is 45 bytes long, giving eight entries per sector and a total of 64 entries. The 16 bytes

of each entry are used as follows:

Byte 1: Flag or status byte. The various bits in this byte, if set, have the following meanings:

- bit 0 - special meaning for DOS 2.5 - see below
- bit 1 - file created by DOS 2.0 of this file in a disk, it is a DOS 1 file
- bits 2-4 - spare
- bit 5 - file is locked
- bit 6 - entry is set (i.e. not that the file is OPEN, but that the directory entry is valid and cannot be used for a new file)
- bit 7 - file has been deleted

In most publications the setting of bit 0 of the status byte is used to indicate that the file is OPEN. However, under DOS 2.5 if the bit is set it appears to indicate that the file can sectors numbered 731 or greater, the file therefore being unavailable to DOS 2.05. When doing a directory read, DOS 2.5 will bracket those files to indicate this to the user. Such files have the value 0 in the directory entry status byte. (Note that as you might expect from the list of bit values above, if you deliberately change the value from 1 to 0 (using a sector editor, the file will no longer appear when the directory is read.) The status byte can therefore contain the following values:

value (decimal)	meaning
1	DOS 2.5 file using sectors numbered 731 or more
36	as above, but file locked
66	DOS 2 file, entry is set as above, but file locked
96	as above, but file locked
128	file deleted

When a file is deleted, bit 7 of the flag byte is set (and all other bits cleared) but the filename is not removed from the directory. The file data itself is not erased, but the sectors used by the file are marked as the VTOC, as being available for use again (see below). Under certain conditions it may be possible to recover a deleted file (e.g. using the DOS 2.5 utility DISKFIX.COM), but probably not if another file has been written to the disk since the old one was deleted. The new file may have used the directory space and sectors occupied by the deleted file, making recovery impossible.

- Bytes 2 and 3 - total number of sectors used by the file as low and high byte format
- Bytes 4 and 5 - sector number of the first sector in the file, again as low and high byte format
- Bytes 6 - 13 - primary filename. If this directory space has never been used, this area contains only zeros.
- Bytes 14 - 16 - filename extension (if any)

Normally, when you do a directory read you only get the filename and sector count, plus an internal number of the file is locked. To get the rest of the information in the directory entry, you will need to use a sector reader which bypasses DOS and reads as the entire sector. From BASIC the directory is usually read using a statement such as: OPEN #1:GOTO 10 ***** However, DOS 2.5 can use sector numbers greater than 736, which would not be visible by DOS 2.05. If

continued overleaf

you use the following statement: OPEN #1,1,A,"D ***". DOS will bracket any file using sector numbers of 720 or more (e.g. in <FILENAME EXT >).

THE VTQC

This is located at sector 360 (single density) or sector 360 and 3204 (enhanced density). An additional item, two VTQC sectors are necessary for an enhanced density disk as one sector is insufficient to store information about all 1623 sectors. Its purpose is to provide a map of which sectors are being used to store files and which are currently free to be used in a new file. The first five bytes of sector 360 contain miscellaneous information:

Byte 0 directory type byte. According to the OS User's Manual, this should always be 2400, but appears to be set to 2 under DOS 2.0 and DOS 3.0.

Bytes 1 and 2 total sector count (in low and high byte format) on the disk available to DOS. Should equal 787 for single density and 1610 for enhanced density.

Bytes 3 and 4 free sector count. This is the number of currently available (free) sectors up to a maximum of 787. It is therefore the same number that appears at the end of a directory read as "free FREE (KB,TOFFS)" on a single density (but not an enhanced density) disk. On an enhanced density disk, the number of additional free sectors is stored in bytes 120 and 121 of sector 3204.

Starting at byte 10 of sector 360 is the sector use bitmap. Each byte in the map contains the sector status of eight sectors, one for per sector. On a single density disk, the map continues to byte 99 of sector 360, but one sector is insufficient to map all of the sectors on an enhanced density disk and so sector 3204 is used as well. Each byte is used as shown:

Byte 10 bit	7	6	5	4	3	2	1	0
sector	0	1	2	3*	4	5	6	7
Byte 11 bit	7	6	5	4	3	2	1	0
sector	8	9	10	11	12	13	14	15

If a bit is clear, the sector is in use; if set, it is available for a new file. (Note that sector zero, although present at the map, does not exist (see above).) The map continues as shown above to byte 99 of sector 360, bit 0 (the rightmost bit) of which represents sector 787. It should be noted that even on an enhanced density disk the map finishes here, and no more bytes of the sector are used. On such a disk, the bitmap at sector 3204 starts at byte 8 (byte 10 is 0 on an sector 360). Bit 7 (the leftmost bit) of byte 8 represents sector 48. The bitmap continues to byte 121, bit 0 of this byte representing sector 1615. Bytes 120 and 121 store the number of currently available free sectors in addition to those stored in bytes 3 and 4 of sector 360. In other words, a freshly formatted enhanced density disk (without DOS files) will have a total of 1610 free sectors. This number is stored in bytes 1 and 2 of sector 360 and will remain unchanged. Bytes 3 and 4 of sector 360 and contain the numbers 787, and bytes 120 and 121 of sector 3204 the number 385 (787 - 385 = 1610). These numbers will be updated as files are created and deleted.

Because the bitmap at sector 3204 starts at sector 48, there is a considerable amount of overlap between the two VTQC sectors. Both sectors will need to be maintained to get the free sector count on a directory read, and both may need to be updated when a file is written to disk. The programmer accounts for the considerable amount of drive head

movement with the version of DOS, which did not happen with DOS 2.05 or DOS 3.

DISK FILE STRUCTURE

After all the above (necessary) preliminaries, let us now look at the structure of files stored on disk. Generally speaking, there are two main types of file. These are fairly, files created and maintained by the disk file manager (linked or chained sector files) and secondly boot program files.

CHAINED SECTOR FILES

These are the commonest type of file and examples include those created by BASIC SAVE or LIST commands, the Binary Save option from DOS, word processor text output, assembler object files and so on. With this type of file, only the first 125 bytes (bytes 0 - 124) of each sector contain file data. The remaining three bytes contain the file link data, which is stored in the following way:

Byte 120 the most significant ten bits of this byte contain the file number, which corresponds to the position of the filename in the directory, and will be in the range 0 - 81. The remaining two bits (bits 0 and 1) plus the whole of byte 121 make up the "forward pointer".

Byte 121 this byte plus two bits from byte 120 is the forward pointer, and contains the sector number of the next sector in the file. Bit 2 of byte 121 is therefore the most significant bit of the pointer. 16 bits of pointer can only store a maximum number of 65535 in binary form and this is why the sectors numbered from 1024 to 1040 on an enhanced density disk are unavailable to DOS 2.0. The same amount of pointer was also used on DOS 3, but since that just one extra bit of pointer would have allowed a true double density disk drive! Presumably Amos did not do this when developing the DOS and DOS 3 in order to cut cross compatibility with previous versions of DOS. However, DOS 3 when produced was totally incompatible with DOS 2.05 for this reason.

Byte 127 this byte contains the actual number of data bytes stored in this sector. For all but the last sector in the file, this should be 125. The last sector might contain 124 bytes, but this won't happen unless the file length is an exact multiple of 125.

From this you can see that the disk file manager finds the first sector of a file from the directory. 125 bytes of data are loaded from that sector and loading continues from the sector specified in the link data. This process is repeated until the forward pointer reads zero, which indicates that this is the last sector in the file. As each sector is loaded, DOS checks that the file number (stored in byte 120) is the same as the file entry position in the directory. If the numbers differ, loading stops and error 164 (File Number Mismatch) is returned. Although this may seem a complex process, it does have the advantage that files do not need to be stored in a string of consecutive sectors, but can be scattered around the disk if necessary, depending on the availability of storage space.

There are two special cases of this kind of file we should consider. Binary files are machine code programs created by the Binary Save option of DOS (which saves a specified area of memory to disk) or the object code output from an assembler. The first six bytes of any such file are known as the file header, and have the format:

Bytes 0 and 1 - both set to 255 (hex FF). This is so

standard for a binary file

Bytes 2 and 3 - the start address in low and high byte format

Bytes 4 and 5 - the end address, again in low and high byte format

When you select DOS option L (Binary Load) the start and end addresses are obtained from the first two bytes of the first sector of the file, and the program is loaded into memory, beginning at the load address and continuing until the end address is loaded. The Binary Save option of EXOS allows you to specify optional installation and run addresses. If present, these are appended to the end of the file. On loading the file, the installation address will be loaded into locations 7F and 7E (INSTAD) and the run address into locations 7D and 7C (RUNAD). On completing the load, control is passed back to the DOS menu if neither of these addresses have been specified. If an installation address is present, DOS performs a machine language ISR instruction to the address contained in INSTAD. The code specified here should end with an RTS instruction to return control to DOS. If a run address is specified, DOS will then ISR to this. Either or both (or neither) of these addresses may be used. Note that they do not need to point to code within the loaded program - they could be used to call operating system routines for example, or just control to BASIC. An AUTORUN SYS file is simply a special case of a binary file. After DOS is loaded on powerup, it will look for a file named AUTORUN SYS on the disk and load and run it if present. To succeed, the file must have either an installation or run address appended.

The second 'special case' is that of a file created by the BASIC SAVE command. A BASIC program is stored in memory in tokenized form, whereby the BASIC keywords and variable names are represented by one byte values rather than their full ASCII form. This has the advantage of saving considerable amounts of memory, but means that BASIC must maintain lists of variable names and their current values so that it knows which token represents which variable. Logically enough, these are called the variable name and variable value tables. When a BASIC SAVE is made, the program is saved as tokenized form and the above tables must be saved with it. In fact, a series of area page pointers and several blocks of memory are also saved, including the following:

1) area page pointers

location	name	function
018,128	LOWMEM	pointer to the lowest memory location usable by BASIC
030,131	VNTF	pointer to the beginning of the variable name table
032,133	VNTD	pointer to the end of the variable name table
044,135	VVTF	pointer to the beginning of the variable value table
108,137	STMTAD	pointer to the beginning of the tokenized program
194,138	STMGUS	pointer to the token in a program has currently being processed, either during input of a line or when the program is run
148,141	STARF	pointer to the beginning of the string and array storage area, and therefore to the end of the program

These seven pointers are saved to disk in the order shown, but before doing so one change is made - the value in LOWMEM is incremented from each one and the resulting value saved. Since LOWMEM itself is saved first, this means that the first two bytes of the file are always zero.

2) sectors of the tokenized program

This comprises the following blocks of memory at the end:

the variable name table
the variable value table
the tokenized program
the immediate mode line

Note that the string/array storage area is not saved, as all strings and arrays are reallocated each time the program is run.

When a BASIC LOAD is made, the seven pointers are read in first, and the value in MEMLOC (location 70,704 - the operating system pointer to the bottom of free memory) is added to each one. The values in two more area page pointers, RUNSTK (44,143 - pointer to a software stack used by BASIC in processing GOSUB statements) and FOR (NEXT loop) and MEMTOP (44,145 - pointer to the top of memory used by BASIC, including the string/array area) are set to the value in STARF. Next, 256 bytes directly above the value in LOWMEM are reserved as an output buffer used when BASIC is addressing a line. Finally, the variable tables and the tokenized program are read in to memory immediately following the output buffer.

BOOT PROGRAM FILES

These are machine code programs which are loaded into memory and run (if desired) by the operating system at powerup. Unlike the binary files discussed previously they do not require DOS to be present in memory or on the disk in order to be loaded or run, nor do they need the presence of BASIC or any other language. The file structure therefore differs fundamentally from channel sector files. However, DOS is not used, sector changing is not needed and boot program sectors occupy 128 bytes of program data and so both files. The operating system boot loader routine always attempts to load boot files at powerup starting at sector 1 of drive 1, meaning that generally speaking there can only be one boot file per disk and this must consist of a consecutive string of sectors beginning at sector 1. These files do not require a directory entry, and sector maps need not be indicated in the VTOC. There is an important exception to these rules, discussed below. As with the binary files discussed earlier, these files contain a six byte header. The six bytes are used as follows:

Byte 0 - flag byte. This is not generally used and is usually zero.
Byte 1 - number of sectors to be loaded, including the first sector. This can range from 1 - 255. If it is zero, 256 sectors will be loaded. What if the file is longer than 256 sectors? See below for the explanation.
Bytes 2 and 3 - the load address. The file is read into memory starting at this address.
Bytes 4 and 5 - the installation address.

What exactly happens during the boot process? The procedure is described in considerable detail in Dr. Ko. Also

continued overleaf

or the Operating System User's Manual, but the following is a brief outline. Cassette users should note that the process is necessarily similar for the cassette boot process.

As part of the powerup routine, the operating system (OS) checks to see if a cartridge is present (as built-in BASIC enabled). If so, the cartridge's "allow disk boot" flag is checked, to determine if the cartridge software permits the disk to be booted (as it would in the case of BASIC; in other languages, but not in most cases). Providing a disk boot is allowed, or if no cartridge is present and BASIC is disabled, the boot process goes ahead.

Assuming drive 1 is switched on, the OS will attempt to read sector 1 into memory. If it cannot do so - if no disk is in the drive for example - the boot process is aborted and the message "NOIT BRACHE" returns to the screen. If all is well, the 128 bytes in sector 1 are read into a specified area of RAM (the console buffer in fact). The first six bytes (the header) are described above. The values in these bytes are then moved to the following locations:

- Byte 0 to location 506 (DPLAGS)
- Byte 1 to 571 (DMSR47)
- Bytes 2 and 3 to 578,579 (DOOTAD)
- Bytes 4 and 5 to 1243 (DMS194)

The sector seven (including the header) is then moved to the area of memory beginning at the address now present in DOOTAD. The remaining sectors are then read from disk directly into the memory area following the first sector.

When the load is complete, the OS performs a JSR to the address contained in DOOTAD, i.e. 0 + 0 = 0 to the first byte of the second program. This part of the program need not do anything, but if the file was longer than 156 sectors any remaining sectors should be loaded by the part of the program contained here. This part of the program should end by clearing the FMS carry flag to indicate a successful load (even if no further sectors were loaded) or set the carry flag if the load was unsuccessful. It must terminate with an RTS.

The OS will then JSR to the address in DMS194 for programs in initialization. Again, this section need do nothing, or is deleted. It must end with an RTS. However, if the booted program is at some stage to take control of the computer, the sectors of the program should save the user for "VERIFY" address of the program into locations 19 and 11 (DMSVFC). If this is not to be the case, DMSVFC should be left unchanged. On powerup, DMSVFC is set to point to the unmanaged (000-400) or 000-000 (DLSK) routines. If DOS is booted, it will change DMSVFC to point to the routine to load the DOS menu. BASIC will jump through DMSVFC when you type the keyword DOS, and this explains why, if you call DOS when it has not been booted, you go into the self-test unmanaged routine.

Finally, the OS will give control to the cartridge software (or BASIC) if present. If both BASIC and cartridge are absent, the OS passes control directly to the booted program by jumping through DMSVFC. Booting DOS without a cartridge or BASIC will therefore go straight to the DOS menu, presenting up the machine without cartridge in disk boot and with BASIC disabled will proceed to the unmanaged without resume. Note that whenever the boot button is pressed, at the end of the wait time process the OS will carry out the final two steps described above.

One special case of booted software is that of DOS itself. Although DOS is booted into memory on powerup, it actually consists of two separate files - the three boot sectors (1-3) and the file DOS SYS. On powerup, the OS reads in the boot sectors and these will in turn load DOS SYS. This

has the advantage that DOS SYS can be located anywhere on the disk, and can be deleted if required. Otherwise, a string of 48 consecutive sectors would have to be permanently reserved for it, even if you did not want DOS into particular disk. However, this does mean that sector 1 takes on a slightly different format. The six byte header is the same as before, but the three bytes following the header are a JMP instruction to the code which loads in DOS SYS. Following these three bytes, there are a series of data bytes needed by DOS. The use of these bytes and their (usual) values are as follows (bytes 0 - 5 are the file header):

byte	usual value	function
0	0	flag/byte
1	3	number of sectors to load
2,3	0,1	load address for the three boot sectors
4,5	04,21	initialisation address
6,7,8	16,20,7	JMP instruction to bypass the disk bytes (JMP 007-0)
9	3	maximum number of simultaneously open disk files (you can have open files in other drives as well). Each open file is allocated a 128 byte buffer. You can exceed this number in a maximum of seven, but you will lose 128 bytes for every additional buffer drive numbers supported - in this case drives 1 and 2. Up to four drives can be supported, and each drive is represented by one bit in this byte (bit 0 - drive 1, bit 1 - drive 2 and so on). Again, this byte can be altered to add more drives to your system.
11	0	buffer allocation direction (as I don't know what it means exactly, but apparently it should always be zero)
12,13	004,25	base usage and address + 1 of zero, it means that the file DOS SYS is not present on the disk. A nonzero value means that it is.
14	1	starting sector of the file DOS SYS in low and high byte format.
15,16	4,0	
17,18,19	125,20,14	1 byte increment of the size of three bytes.

Note that the value of some of these bytes may vary from the above depending on disk configuration and customisation of DOS. The Disk File Manager (three boot sectors) and the file DOS SYS form subprograms in the usual make for boot programs. Although DOS SYS acts in all respects and purposes as a boot file, it has a directory entry, its sectors are marked as "not" in the VTOC and it has a linked sector structure. The actual three boot sectors however are a conventional boot file with the right reference to sector 1 described above.

And that just about completes our discussion of Atari disk file structures¹ in order that you may learn a little more about disk files. I have written a simple sector editor but that will have to wait for the next issue. See you then. ■



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01 0000 000000 / 0000 0000 0000 0000 00
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The XEP80 Atari's 80 column board and printer interface

by John S. Davison

For me, as an avid 8-bit user, there was one outstanding item in last year's PCW show: It's presence took me completely by surprise and generated more excitement than any of the myriad other products on display. I found it on the Atari stand, seemingly unattended by the passing onlookers.

It goes by the code name of XEP80. It's purpose? What for it...to provide a high quality 80-column display for the 8-bit machines. You folks, Atari have actually gone and produced the 80-column board and we've all been waiting for that all these years. And it's so available!

It plugs into the expansion port and is driven by a handier board from disk. You can use it to write any text BASIC and other programming languages, but unfortunately not with Atariwriter. An Atari representative said he thought this anomaly would be handled in one of two ways. Either a new version of Atariwriter Plus, or a special edition 80-column driver would be produced for it—the exact form which he said he expected other producers of serious 8-bit software to support in fairly soon.

Does it mean you need a dollar more to make use of this device? Atari were using a Philips monochrome monitor

for the demonstration, and the quality of 80-column was nothing less than superb—the text was rock steady, most sharp and perfectly readable. As well as displaying normal 80-column mode text, the XEP80 has one or two additional tricks to offer, too. Text fields can be displayed in normal or reverse video, and in a steady display or flashing. You can also choose to have the cursor flash—no more losing it in a moment of inat! There's also a double height character set you can use for headings, menus, etc, and the full ASCII character graphics set is available. The driver has it's own RK memory and thus is accessible to the programmer, allowing use of various character sets.

As if that wasn't enough, Atari have included a standard parallel printer interface on the back of the box, so you can plug in any Centronics type printer. It sounds as if this device could be the basis of the renowned 'Assorted keyboard' word processing package.

At this point I was searching for my cheque book, but unfortunately the XEP80 was not available in the store. The model on display was out of only two in the country. The good news is that it is scheduled for the end of 1980 and should be available in the shops by the time you read this. The cost? Somewhere around £79.

I guess you have just solved the problem of what to buy with all that money you were given for Christmas? I just can't wait to get my hands on one!

2 BIT SYSTEMS: MUSIC PRODUCTS FOR THE 48K ATARI

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STAGE

The PAGE 6 ST section

FORE!

GOLF ON
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Microdeal's Karate Kid II

TYPE-IN
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101 ST HINTS AND TIPS

(well a few!)

I was recently speaking to one of our experienced staff about the hints of "Did you know you can..." when it became apparent that we each knew a few tips on using the ST that the other did not know yet (both thought everyone knew! So, in an effort to document the (possibly) unknown, we will start this column. It may only run for the next but at least you will know where to look as if any readers have discovered other hints or tips for the master use of the ST or know of any we have missed please let us know and we will include them in the next issue.

SELECTIVE COPYING: Hold the Shift key while clicking on files to copy. This way files can be chosen or random instead of in blocks.

STOP PRINTING! If you have started a screen dump and for some reason wish to abort, just press ALTERNATE-HELP again.

CHANGING ICON NAMES: If you want to label your drives in a more meaningful way, for example "mass drive" and "backup" or "top drive" and "bottom drive", click on the icon and then drop down Install Drive from GEM. Define the correct name and type in a new case. Once done save the desktop to the disk that you wish to use for booting up. You cannot change the Trash Can name in this way but the DESKTOP.IMP file can be loaded onto an ASCII word processor and changed provided that you don't use a name longer than the existing one. Just save the Desktop again when it has been changed.

CLEARING INFORMATION: In most cases the ESC key will clear an existing filename so that it is not necessary to backspace. This applies to filenames on Selection Windows and also to the Command Panel when you want to change the name of a file.

DISK DIRECTION: To find the contents of a disk quickly, open a window on a particular drive and then insert a new disk in that drive. Instead of double clicking and opening another window just press the ESC key.

USING INACTIVE WINDOWS: Normally if you want to copy a file from an inactive window you click on that window, drag the file across and then have to click on the original window to re-activate it. By holding the right hand mouse button at the same time as clicking the left button, you can select files for copying from inactive windows thus saving some considerable time.

I hope that a few of the above are new to you and will help you use your ST to greater effect. As I said above if YOU have any hints or tips, please let us know.

Les Bingham

Microdeal should by now have **Kaizen Kid II** out and if the game is anything like the initial graphics then it should be a winner. These graphics stopped every passer by at the PCW show and some of the users in need to evolve the full screen graphics. The game closely follows the film and, in addition to fighting, involves such items as breaking blocks of ice and walking files with chopsticks! There are no points, no high scores, just survival and the chance to become a hero.

Another new one from Microdeal for C programming is **Binary Record** a file management system for programmers to keep and access data records in an orderly fashion. A size of dedicated database, it will be £29.95.

Interface Technology in the States has announced the development of an adapter to allow the 32857 or 16485T to be used with a standard IBM style (VTL RGB) colour monitor. The mapping into the video output and handles a Colour Graphics Adapter with 6 colours at medium resolution and 4 colours at low resolution. Also planned is a complete Video Adapter which will allow the use of a standard mono monitor at the low and medium resolution modes. Price of the first adapter is \$89.95 and details can be obtained from Interface Technology Inc., 1480 Cherry Lane Court, Suite 218, Laurel, MD 20775, U.S.A.

Babak have a special Christmas offer, **Macro Manager and RT Toolkit** both on one disk for just £24.95 a saving of over £15. Hurry, Christmas is nearly over!

Apps and U.S. Gold have just released **World Games** at £24.95, a follow on from the highly popular **Summer and Winter games** but this time featuring sports that don't make use of the Olympics. The game includes a world map and forecasts each sports to cater tennis, skill driving, ball rolling and leg riding. The graphics are excellent.

Koma keep them coming with a new GEM based word processor called **KeWORD** and an improved version of their common package called **Ke-CONSOLE**. Also recently released is an upgrade to **Ke GRAPH**, **Ke WORD** and **Ke CONSOLE** both priced at £49.95 and are up to Koma's usual standards.

Microcom have released two new languages for the ST thus extending the scope of the ST even further. **Cambridge Lisp** is said to be the most powerful language yet to become available for the ST and **BCLP** is a powerful programming language based in a wide range of applications from personal and operating systems to applications and games. **Cambridge Lisp** at £149.95 and **BCLP** at £79.95.

New releases from **ALIENT SOFTWARE (UK)** are **Magnum ST** at £29.95, **Typesetter Elite** at £24.95 and **Write Plus** £19.95. Magnum has been well known and respected in the Atari 8 bit world and now gives ST owners the opportunity to print ASCII, for Word at similar files as a variety of text styles. Different type and lines may be used on the same document and in addition graphics files from **DEGAS**, **Newschrome** and **Rubber Stamp** may be included in the text. **Typesetter Elite** is a GEM based page layout system for use with a dot-matrix printer and is ideal for newsletters, broad-sheets and the like. Graphics, multiple font styles and sizes may all be included. **Write Plus** could become the most indispensable program for anyone using spreadsheets as it will print any file allowing you to use dot-matrix printers. Certainly a lot cheaper than a wide carriage printer! *

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Metacomco **MAKE**

reviewed by Matthew Jones

As I have often said in my language reviews, a typical programming session is a cycle of editing, compiling, linking and running / debugging. Last issue I covered Make+ from Metacomco, which is designed to make this cycle easier. By selecting 'edit' in a menu, your editor is loaded and run, automatically loading the file you are interested in. Conversely selecting 'compile', 'link' and then 'run' allows you to smoothly start each process, but there can be problems with such systems. For instance, if you want to edit multiple files, having to select each in turn can slow you down, and the link option becomes complicated.

Make+ driven systems (last part Make+) are all about here when you are only dealing with one program. For the larger programs Metacomco's MAKE program comes into its own. Operation is very simple, and, when working properly, it should save you much typing, and a fair bit of time. MAKE works by using the date time-stamp that is put on each file when it is written to (this means that you must always set the time accurately). When you edit a file, for example 'main.c', the time-stamp is set to the current time. When MAKE is run, it looks at the file known as a MAKEFILE which contains directives which tell MAKE the dependencies of each file.

In the example given, the makefile instructs directives telling MAKE that 'main app' depends on 'main bin' and 'main lib', which in turn depend on 'main c' and 'main o' respectively, each of which depend on a single header file 'head h'. With this information, MAKE would look at the date time-stamps of each file, and if 'main app' is older than any of its dependants, it will carry out instructions that lead to the makefile on how to update the file. As 'main app' depends on 'main bin' which depends on 'main c' which, due to the date above, is more recent than 'main app', the instructions required to make 'main bin' from 'main c' then have to link 'main lib' and 'main bin' (the linker), and if 'main app' is up to date. If I had edited the header file, both files would have been compiled, then linked. This may seem an antiquated technique, but once you have your makefile set up correctly, the whole process is automated just by the date changing in MAKE.

```

# A SIMPLE MAKEFILE
# The files involved
SUBDIRS = main.o main.c
OBJECTS = main.o main.lib
# The files
c main.c
o main.o
main.lib main.lib.o
# The dependencies
main.o : main.c
main.lib : main.lib.o
# The dependencies
main app : main.o main.lib
# A few more dependencies
c o : /usr/include/sys
c o : /usr/include/stdio
# end

```

Example MAKEFILE

When you are dealing with large numbers of files, this is by far the easiest way to manage them. Firstly you do not have to remember which ones you have edited or MAKE will find out. Secondly, once you have created MAKE you may do something more useful than wait for the compiler to finish to be ready to start the next compilation. If you tell MAKE to sound a bell at the end of the compile / link, it will show your attention what time. There are disadvantages to this however as if, for example, you have edited a file but don't really want it compiled, you can get MAKE to sound a bell by running a 'bell ringing' program at the end, however if there is a compile error this does not happen and the procedure will end silently.

The makefile example is an actual file which I have been using myself. It demonstrates several points, first that you can set macros to represent groups of files (this list can spread over more than one line). I found that MAKE will hang (ie. go to sleep) when I put a macro in either side of a dependency. Also, the dependency using the header file 'head h' does not work (I used it did never to illustrate the principle). I have another makefile which has two such header dependencies, one of which works, but the other doesn't, and I can find no explanation. Also worth mentioning is that you can set an 'implicit rule' to compile the .o files, which saves having to define the complete sequence more than once.

The MAKE manual is very technical, and is not particularly easy to read or understand. I must say that I am not sure that all the problems I have had are bugs in MAKE, it may be that I don't fully understand the manual, but the code really is the same.

Two extra programs are included on the disk, the first is a 'TOUCH' utility which is used to set the date/time-stamp of a file to the current date & time. I found this to be useful when I forgot to set the date at power up, and also for forcing recompiles. It seemed to be no trouble stamping all the files in a large (50+ files) subdirectory though. 'SETDATE' is a program for your host disk 'AUTY' folder, and allows you to set the date and time. I found it very frustrating, especially as it is very slow in format (it won't even let you press RETURN to skip it), and as the date is set only once on most, it is effectively worthless. If you want such a program, see EURODATE, a public domain program which is far less strict on format, or something similar.

To conclude, MAKE is very suitable for any programming situation where you are doing simple editing more than one file. I have found that once it has been fine-tuned it is very reliable, and although there is a slight overhead when it checks the dates of all the files, it saves time which would have been lost typing in the next file to be compiled. The manual is perhaps a little confusing, but at the end of the day it is a worthwhile utility.

MAKE runs £19.95 and is available from: Metacomco
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GAMES ... UTILITIES ... SERIOUS OR FUN , IT'S ALL ON THE ST

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WINTER GAMES

Epyx Computer Software
£24.95

Reviewed by
John Davison *jr*

Winter Games is a collection of a Winter Olympic Games (it is the sequel to the highly popular Summer Games) which can be found on ATARI 8-bit discs. There are seven events to play, Ski Dog, Bobsled, Speed Skating, Figure Skating, Ski Jump, Free Style Skiing and finally Bobsled. Every single event in the Games has its own theme music which plays while the event is loading. There are all extremely good and smooth, in a way, the type of event.

When the game first loads, a colourful animated title screen leads into the opening ceremonies, complete with the lighting of the flame and the fly past by some highly decorated doves. You are then put on the main control screen where you select whether compete in all the events, compete in some events, compete in one event, practice an event, see the world records, watch the opening ceremonies (again) or leave Winter Games. If competing in an event you can select your country out of a choice of 16. The screen is almost the same as Summer Games on the 8-bit discs.

To give you an idea of what to expect let me take you through the events. Ski Dog Assault is a demonstration sport, you have to perform several set steps on front of a panel of judges. Moves you can perform include, Back and Forward Flips, Side Kicks, Delfy's, Back Somersault, and Spruce. The graphics in this event are fantastic. The backdrop is just like an old painting, with highly detailed pictures of mountains and trees. The animation is very, very slick. Bobsled is a combination of some country flag and target shooting. It

may even take a strange combination, but it is great fun. Again the backdrops are superb, in this event there are four animated backgrounds all of which are amazing! The animation is very good, my only complaint is that the event is a joystick 'wiggler', in other words, you have to move the joystick left and right very quickly to achieve any desired result. You can use the keyboard (as in all the events) but I don't advise that for this event.

Speed Skating is another 'wiggler', but not quite so violent. You have to move your joystick to move the skater's legs like a real harness. The animation in this event is superb and even the swelling (considering the ST has no-handware sound) but the background graphics have no 'patina', in fact the truth they are downright boring. The occasional flag collection in the event adds the number of entries travelled until by in goes the discuss of movement.

The music in the beginning is very catchy and although the musical effects are relatively good there are not enough of them.

Figure Skating consists of a one minute, timed routine of some compulsory movements: Camel Spin, Sit Spin, Double Axel Jump, Double Loop Jump, Triple Axel Jump and Triple Loop Jump. The graphics are back to the standard set by the first two events, superb, slick scrolling and smooth animation. None of the movements look so natural and the music is well received. Ski Jump: Fantastic graphics in the event and a really dramatic race to get you going. The animation is also very good and the background graphics are (as again) superb. Ski is in a really top class this one as it is a straightforward and good to play Free Skiing. This event uses the same graphics and animation as the Figure Skating. The difference is that you have two objects to control your own routine and you don't have to do each move just once (you must do it more than three of each) (though). The music

is very different - it's all drums and modern 'pop' type music - overall a superb event.

Bobsled: This is a very pretty event with smooth animation, good background graphics and nice sound. There you enter in the something missing from the playability point of view. I couldn't find as much motivation for this event as for the others.

The program comes on two single sided disks and has a detailed, easy to read 12 page manual. Overall I cannot deny that this is a superb game and anyone who is looking for a great sports simulation for the ST should check this out, it's great! £24.95 is not a bad price, but still a bit expensive for a game. Let's hope the price of ST software starts to come down soon!

ST KARATE Paradox Hibernia Software £24.95

Reviewed by Lee Elingham



Paradox was one of the first companies to release any games on the ST with Microsoft Mouse which ran at 10000 only. I never use a Microsoft copy but what I did see only really came into the 'thought' category. Nothing else seemed to happen for a period of time, and finally, at the PCW show in 1986 Paradox kept me with on line from an ST games all on glassware which said

continued overleaf ▶

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ROBTEK TOOLKIT consists of 6 utilities that use the GEM environment. They will help you in a very simple way to get more speed and power from your St computer. Robtek's toolkit is not only designed for professional users but also to assist non-programmers working with the Atari St. Full instructions are given on the screen during each operation.

- **PRINTER SPOOLER:** This utility makes it possible to use your computer while you are printing. A section of the computer's memory is reserved for printing, and information is stored there. The information is transferred to the printer when needed without interrupting other operations of the computer.
- **RAM DISK:** This utility will speed up your file operations, saving you hours of time. Robtek's Ram Disk will reserve a portion of memory as a software image of a disk drive. Not only is this faster but also more reliable as there are no mechanical parts.
- **DISK COPY:** Is a utility that helps you make backups and format disks at a much easier and faster speed than normal.
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● ENGLISH, GERMAN AND FRENCH MANUAL

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● ENGLISH, GERMAN, FRENCH MANUAL

Robtek

Robtek Ltd., Unit 4, Isleworth Business
Complex, St. Johns Road, Isleworth, Middx.
TW7 6NL. Tel: 01-847 4457

with much-compatible sound to boot! Hopefully we will bring you reviews of these in the coming months, but let's start with one that they are quite proud of themselves.

Karate games on screens are beginning to get a bit boring, if new designs already on hand said they are programmed. With ST Karate there is no need to worry, it is excellent. Well programmed with good graphics and sound and fairly easy to begin but rapidly becoming hard? You have a choice of one player against the computer or two players competing. Moves and sound effects can be switched off and there is a high score table. The game is played with the joystick and control is quite complete in every fully. There are no less than 25 possible moves depending on whether the hot button is pressed and the same number with your fingers being in the opposite direction?

At the first level fighting against the computer is not too difficult and, since you have 10000 (however the controls you should easily get to the next round. In fact the same version is fought a second time before the background changes and added levels are introduced. Flying 'stars' or whatever these items are called are things are called can be revealed and harassing you can be broken for extra energy. (It is through this round and you are given out with a whole lot of bouncing pins to destroy and if you can get past this level you are doing well. Here comes my only criticism of the game. In addition to the instructions, which are not good anyway, don't indicate when you need to do. By the same you have thought about it you are dead! I am not going to tell you how to get past this round (I had to figure it out) but if you do you will then fight against two opponents. You will then have to fight them again. What happens when I don't know, by the time my opponent had hit like I had been breaking the proverbial horse's back all day?

I must admit that I thought this would be a first, but it had me hooked because of its quality. Excellent graphics, good music, designed round you (the good) and extremely playable with just the right degree of difficulty. Highly recommended if you enjoy this type of game. Watch out for the outstanding wrap-around packaging which looks great on display but is not easy to put back together once opened and look out for notes from Paradise, it might be as good as that.

K-SWITCH Karna £29.95

Reviewed by Matthew Jones

Do you work on the sort of machine where you may be working on your word-processor, when the phone rings and someone wants you to give them some information from your database? Of course you have to save the documents, quit the word-processor, and then load the database, load the file, and access the record. The caller takes the information, and then you have to reverse the whole process right back to where you were, and then the phone rings again.

One answer to this type of problem is Karna's K-Switch, a disk accessory which allows you to have two programs in memory at the same time. K-Switch is installed by slotting the K-Switch accessory at the desktop, inserting your options, and then them on your computer is split in two. The access of K-Switch is to tell the ST that it has only half of its memory (the lower half), and to use the other (upper) half to save a copy of the lower half. K-Switch is then transparent, and you then carry on using your ST as normal (though with half the available RAM). Now, when the phone rings, instead of saving the documents etc., all you do is hold the ALT key, and press both SHIFT keys. Within a second you are working back at the database, and may proceed to load your database. The next, when you have finished accessing the database, you press ALT and the two SHIFT keys, and you are exactly where you were when you left the word processor. When the phone rings again the next time, you can switch straight back into the database.

K-Switch can be used with many applications that require that switching between two programs. K-Switch has a RAM disk option to provide a fast way of putting data between two programs (Karna gives the example of their K-Signal spreadsheet) and K-Signal starts programs, where you can do calculations on the spreadsheet, save them to the RAM disk and load them into the switched K-Switch. It may cause problems with other programs that use the ALT or SHIFT keys spontaneously, for example a graphics driver that uses ALT to exit, but otherwise K-Switch will remember all the significant memory records,

including the screen resolution, between switches. Karna wants that you should not be accessing the disk drive or using the serial port when you switch because that can interrupt saving, and may have side effects.

When installing K-Switch, you can choose to have both the switched and the RAM disk, or only one of them. Once installed, K-Switch will allow you to save or load the contents of the switched memory or the RAM disk, which means that you can save a 'worksheet' and return to the exact point on a least file. By saving the RAM disk, you could revert to a command set you fell through, rather than copying files one at a time.

K-Switch is a very easy to use utility, and is invaluable if you are constantly loading and re-loading two programs. The main problem is with the use of memory available to each program, and you should think that each will use no half of that of your machine (less the RAM disk and accessories). One caveat or larger than should be made, problems with software is being written to run in a maximum 512K.

THE ALTERNATIVE. Microdual Colour or Mono. £29.95

Reviewed by
Mark Hutchinson

The Alternative is loaded to an Accessory file on the GEM desktop and can be called on the drop down menu. It is a system that will allow you to store often used phrases and statements and instantly recall them by using one of the designated ALTERNATIVE keys.

So what does that mean? Well, suppose you use BASIC or in fact any GEM based program (LOGO, for Word, GDT 'C' or whatever) you will probably use certain phrases and statements quite often. In a program why bother to type, for example FOR FALSE = 1 TO 100 NEXT PAUSE if you can just press ALTERNATIVE 1? If you have defined the key, the Alternative will print the statement on the screen immediately.

The Accessory will let you set up a file of key definitions using an edit editor, for which you must have an ST

columns display, and then save the file under your own name but in the extension .ALT. You may have a different file for each of your programs. The file will cover 16 alternate key combinations but you may concentrate using the ones which mean that they can combine the maximum of column keys. Be careful not to get into an endless loop using this though! The keys used by the Alternative are the characters A-1 and 0 to 9 and each will start a string of up to 40 characters. If you wish, the Alternative can be bypassed by pressing ALTERNATE and -.

My copy of the program worked well. I spent a lot of time using a word processor but as I use very few standard characters with a word processor I did not find a lot of use for it in this context. It comes into its own, however, when used with a language (like BASIC) as well with the list editors found with Module 2 or 'C'. The only problem was remembering what each key was for. The ability to point a mouse reference would be very handy.

The Alternative is easy to remember as an accessory since always there and has separate data files. If you should be unable to get it up and visit it help from it is a good by. There is a similar program about to be released which may give a some competition but it is a good program and I would recommend it.

DB-Calc

Rubtek
£29.95

Reviewed by Alan Goldbro

DB-Calc is a Database with a difference, that is if you believe the wordsmith of the manufacturer. Gary Bond, a one of the friendly heads of Deep down means, answers and those irritating error messages that keep appearing every time you press the wrong key or wrong the mouse by or not!

DB-Calc's claim is there is the possibility of calculating mathematical formulae to take the difficulty out of producing stock lists, financial savings and economy. Calculating Databases are nothing new. Household names as DBase II or 10, 16 and Sybase+ on the 16 bit side for calculations. There are other programs such as VIP Professional which primarily is used as a spreadsheet but is more than

adequate as a calculating database.

The first advantage of DB-Calc is a choice of two files. DB-Calc for 320 (half meg) and DB-Plus for 1640 (1 meg) versions. The first file can hold up to 10,000 lines of data and the latter 40,000. Working on four lines per record it is possible to have a file of 2,500 records or 10,000 records respectively.

Setting up your database requires a template to be constructed, a.g. name, address, telephone, or even lines, Number, Stock, Quality required, Quantity left etc. All the fields are created as the Data Window and are easily edited or deleted. As soon as you have created your fields you are at liberty to start entering your data. Setting the database is so fast that if you think you'll miss it DB-Calc will see both a physically and a numerically from A to Z, Z to A, 1 to 9999 - 9999 to 1.

Search has a greater range than Sort. Selection can be equal to, not to equal to, less than or more than and wildcards of "*" and "?" are allowed throughout. Data is selected one screen at a time. If that example you wanted to refer from a customer accounts database you must firstly decide on which field the selection will be made, for example Town and then select which rows you require. Selection that pass the chosen criteria will be placed in a temporary file and from that selection you may to narrow the chosen down by selecting one particular item of the rows. If you wish you may select individuals who have more than £100 in their credit and so on. This data selection can be saved under a separate file name for future retrieval. All the selection criteria is shown in a separate window adjacent to the data window.

Calculations are performed through another window called a "Model". Information from the reference window will be used only. From here the program acts on a different approach and the formulae for the calculations must be typed in manually or copied in to taking from a menu. The resultant information from the model can be dumped to screen, disk or printer. If you require a hardcopy then the model allows you to store printer communication desired to have total control over the output.

Files may be saved, loaded or appended together provided they have the same number of fields and the same field names.

A number of good points can be

made about IMCALC, GEM Environment, Windows which can be saved in one, variable windows, calculating capabilities, automatically locating notes and statistics, functions, keys, reporting features, good printer control and price (£49.95) however there are unrefusable points.

DB-Calc was written in Multimed and while the program is excellent in its operation, there are extremely difficult screens to grasp fully, especially for review purposes. There are a few sample files with which to work with but they are limited as digital and value. The manual of twenty four pages unfortunately looks as though the translator learned English as a third language. Some of the instructions on screens are different to those in the manual, for example, the manual says "Add field" whereas the screen menu says "Insert field". This only adds to the confusion as much of the manual is not easy to follow and some of it is in logical order. It constantly jumps from screen to screen and very little help is given. Screen pages shows on the manual cover many of screen messages and much of this option could be used as producing clearer instructions.

DB-Calc would be immediately recommendable for its capabilities and its price tag if it wasn't for the really inadequate manual and lack of tutorials. I think the program has good potential and, given its price tag, could be a market leader. I hope the British distributor will take one of these comments and produce a really comprehensive manual to go with what is obviously a quality database.

The disk comes packaged in a video type plastic box and it will present against copying. This will obviously cause some problems if you have a hard-disk or are concerned about backups. At £29.95 a good buy but only if you can decipher the manual and are prepared to spend some time to get the best out of it.

HELPMATE

Royal Software
£24.95

Reviewed by Alan Goldbro

Helpmate is one of the latest of cheap yet accurate core available for the ST range, comprising of three different programs which can be used separately or when any Core program

continued overleaf



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REVIEWS ... REVIEWS ... REVIEWS

Calculator, Calendar and Phone pad make up *Minipace* and are accessed through the desktop after booting up. The three files can be split up and copied onto your appropriate host disk.

Calculator—This resembles a standard four function pocket sized calculator available almost anywhere. All the standard keys are there plus Memory and a 'Copy Key'. Screen keys are activated by using the key pad on the ST or by pressing and clicking the mouse and are displayed immediately on screen. The only exception to using the method is the 'Copy Key' which can only be accessed using the mouse.

The screen keys actually flash when you press the corresponding keys on the ST. The function of the Copy Key is to copy the value of the calculator's display on to a file on disk. This file has a pre-set name [*Copy TXT*] which can be called up by a GEM based Word Processor such as *1st Word*. The file will automatically overwrite itself to multiple dumps to disk will result in the last file copied being the only one available for pasting into your document.

Calendar—To get the best use of this screen the user will need to follow the screen's date and time. Using the control panel window on the Gem Desktop, you must type in the correct date and time although those of you who use a clock card can bypass this operation. The 1987 year calendar, like the calculator, is selected from the Desk Drop-down menu and is displayed on the screen. Provided the date was correctly set prior to the calendar's display will show you the correct month and from then you can either display the previous month or the following month and continue to scroll through the months as well.

Select a date by clicking the mouse on your choice and the 'What' feature is activated. Based on the 24 hour clock you type in the time of your appointment or reminder and a level (amount) of up to sixteen characters. Click on the OK panel and a screen is memory. A maximum of six appointments are allowed per day. As the given appointment time, a 'pop' is heard from the speaker and a box is displayed on the screen with your appointment message. If you require it, a list of appointments can be dumped

to printer although every time I tried this the date was always 12/34 even though the screen display showed the correct date and the alarm 'popped' in the stated screen time. **Phone Pad**—Not much use in this country as we have a different telephone system from GM (Ms Bell in America). The main function of this file is to list up to 100 names and telephone numbers and, provided you have a Hayes compatible modem and the American system of pulse tone dialing tones, it will automatically call-up your preferred number. At a point you could use the phone pad's a more data base to record phone numbers etc., but unless all your contacts have three figure area code, you won't get much use out of it.

All the accessories can be entered around the screen or overlaid on top of other GEM applications. The manual is eight pages long, well written and informative. Overall I found the program fairly useful, well reviewed screen's, although priced at £14.99 I feel it's a little costly for what you get. If it had a more pad version of the phone pad then it may appeal to a wider audience.

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LEADER BOARD

Sports simulations are the hot topic in computer games in the moment and golf is the latest to be computerized on the ST. Leader Board has already had great things said about it but it isn't the only golf simulation available on the ST. In the second part of this review we will take a look at its main challenger, Mean 9!

I suppose I ought to confess from the outset that I have become hooked on computer golf. It seems the ideal game for individual play or for challenging a few friends. It has the right degree of challenge requiring a little dexterity and lots of thought, unlike many of the arcade style games which I find most fun to play. Leader Board has several options to enable you to start at the appropriate level. Novice level sends your ball down the fairway true and square and is ideal for your first few rounds. Later, your progress as Amateur where you have to control the hook and slice of the ball while Pro level adds the effects of wind to the game.

The screen presentation is superbly realistic with your view from behind and slightly above your player who is represented as a detailed human figure. You can see so far down the fairway as you would expect on real life albeit of course means that you often cannot see the green. On the right hand side of the screen is information about the hole you are playing together with current scores and wind details. Your first task is to select a club which is done by moving the mouse forward or back. I found this to be a little tedious and prefer the Mean 9 style of 'clicking' to select a club. The direction of your shot is determined by a small cursor which is controlled by the joystick and 'twist' above your golfer. The system button is used to control the power of the shot by watching a small power bar on the right hand side of the screen. It is really quite small and it is fairly difficult to judge the precise power of your shot, that will take some practice. If you are playing as Amateur or Pro level you must also use the mouse to control the hook or slice to the wing comes down. You can do this either by watching the golfer as the power bar. Once committed there is no second chance to reach the ball and watch it roll down the fairway.

Now you get to see just how realistic this simulation is for friends! The ball will roll into the distance and bounce a few times before coming to rest, hopefully on the fairway or green. If you land as a bunker, the sand will kick up and, on a short hole, it is perfectly possible to see the flag and watch the ball bounce away! I have not yet attempted a hole in one although I understand it is possible. The course holes have trees, bunkers and rough and are often surrounded by water. Thus a possibly one of the disappointing parts of the game as the holes are all distances (unlike Mean 9) and are the product of the author's golfing tastes. You need a really fast car some of these courses or need to practice that ancient art of walking to a hole!

Once your shot is made the screen redraws very quickly to show the new position of the ball and you are told the distance from the hole. Select another club and, hopefully, the next you will be on the green. Now the choice of a Putter only is necessary and you don't have to worry about hooking and slicing. A putt on the green casts a shadow to indicate the lie of the green and you only need to see the direction and power of the shot. With luck you will hear the hole made as the ball rolls over the hole and it's off to the next tee.

FORE!



Superb realism

There are four courses on the main disk, of increasing difficulty, and also a driving range for practice. A few shots here will soon get you into the swing of things (sorry). There is also a game mode which may be designed to encourage you to the putting is not that good!

THE TOURNAMENT DISK

Once you have mastered the courses on the main disk you can get the Leader Board Tournament Disk (it, which adds four new courses for your enjoyment. These are even more challenging than the originals and in real life the course designer would be hard pressed to find a club strong enough (or rich enough) to build such courses. Strangely though, the courses are not that much harder and will add the right degree of extra challenge without becoming impossible. I was able to get round the first course in just 4 days just despite having played the original courses only a couple of times.

Overall it has to be said that this is one of the best sports simulations of all time. The graphics are superbly detailed, there is a sense of realism as you play each hole and you the right balance of difficulty. Leader Board is a game equally well suited for play on your own or with friends where you will find the competitive edge comes to the fore. The alternative will really start showing when the scores are close with only two holes to play! Be warned though, Leader Board is a game that you will play for hours on end. There will surely be a few new holed-in holes, computer and golfing addicts!

ENJOY A GREAT ROUND OF GOLF ON YOUR ST

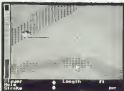
reviewed by Les Elingham

Mean 18 comes hot on the heels of Leader Board and it needs few comparisons, which in some respects is better and others worse. Let's do some comparisons.

Mean 18 is played in the same way as Leader Board but offers a lot more options. The first thing to note is that the courses are based on real life courses which, in my mind, makes the game a lot more interesting. Additional course lists are provided so that eventually you may be able to travel the golf courses of the world, without leaving your front room! All the features are present on each course but the graphics, while still good by computer standards, are not a patch on Leader Board. They are more in the old computer 'representation' style but are nonetheless perfectly acceptable.



Looking down the fairway



On the green

MEAN 18

In this game your view is again from behind your player but the direction of the ball is chosen by clicking on an area which alters the perspective of the course. Each click scrolls the scene backwards so that you have a slightly different view down the fairway. The power and look or direction are the same as in Leader Board except they also power that in the full height of the screen. I found this to be a lot easier to control, both the power and 'swing' of the shot. The ball again rolls down the fairway following into the distance and here some of the more differences become apparent. Firstly, as an advantage, you can click on an area to get an elevated view of the course which will show you precisely where and in which direction your ball travelled, a nice touch. In general you can get a better feel of where you are both on the fairways and on the green. The difference on the ball side is that the screen is very, very slow to redraw requiring the mouse to be clicked several times with the course fading away in the areas of the screen and then reappearing. It takes about ten seconds overall but there is a noticeable 'thinking' time before the screen changes and I found it quite irritating.

Once you get on the green, the program looks an overhead view of the green to show you the lie of the green and the position of the ball. It is much harder to judge in this stage of the game and a lot more precision is required than in Leader Board to get it right. Click again and you have a 'birds-eye' view of your putter with a solid line from the club towards the hole. You move across this line according to the lie of the green and in addition to setting the power of the shot must also control the 'swing' or whether you hit the ball to the left or right. Play down the hole and it's off to the next tee.

As well as the choice of courses, you can opt to play regular or professional sets and can also practice or play any particular hole or set up a green to practice putting. You can also save a game any time, which is useful as a game can take quite some time and there is a Hall of Fame for you to permanently save your records — two distinct advantages over Leader Board. But the biggest advantage is that you can build your own course! A utility provided will allow you to design any course you desire, so that you can make the game as challenging or as easy as you like.

Overall the options are much wider but the realism is less than with Leader Board. Mean 18 is much more like a computer game than a realistic simulation but is nevertheless very good and will be interesting and challenging.

WHICH TO CHOOSE

Collegiate editors will prefer the real life course of Mean 18 and the realism of scores of Leader Board. Hard to choose! I personally prefer Leader Board, principally because of its 'ease of the art' which has been to allow the Mean 18 player a good game as well. Two games that are the same yet totally different. You won't be disappointed whichever you buy and they are sufficient to differ in without trying both.

Leader Board is available in the country from US Gold at £39.95 and the Tournament disk at £9.95. Mean 18 is imported at £49.95.

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OTHELLO

by Paul Lay

Requires ST BASIC
Runs in low resolution only

This is a version of the popular board game Othello. You play against the computer using the mouse to select your moves. The player always plays with white counters and the computer with black and each side alternates turns in placing one of their counters on the board. A counter must be placed so that it and another of the player's counters trap an unbroken line of the opposing counters either up, down, left, right or diagonally. Any rows which are trapped are then flipped to the opposite colour. Once the board is completely filled the game ends and the winner is whoever has the more counters on the board. If no more counters cannot be placed on the board, then the game is a draw.

THE PROGRAM

The program is written in ST BASIC. On running the program you will be presented with a title screen on which there are two choices 'Player Starts' and 'Computer Starts'. You can begin the game by clicking on either of these with the mouse. When the game begins the board will be drawn together with a message window and an about option. The message window displays whose turn it is and also displays the scores at the end of the game. Clicking the about option will enable the player to store the game on his turn, useful if you can't make a move as you are going abroad!

On the player's turn, clicking a square on the board will cause an attempt to place a player's piece on that square. A counter may only be placed if the square is empty and causes a row of the opposing counters to be flipped if, on the computer's turn, as soon as possible, then a message is displayed and the game stored.

PROGRAMMER'S NOTES

One interesting point which arose during the writing of the program was that, if the desktop accessories were loaded up with BASIC, then there actually show some of the colour registers. In order to overcome this problem the colour register should be set from within the program. This is done by the following code:

```
poke word4,14  poke word5,14: poke
word6,8:4
poke word7,0
poke word8+4,14:17: poke word9+4,17: poke
word10,8,14:17:
word11,0
```

where 0 is the colour register 0 to 15 and 8, 4, 8 are the addresses of red, green and blue respectively in the range 0 to 255. Refer to the code starting at line 1448 for an example.

```
10 rem *****Othello*****
20 rem 1
30 rem 2
40 rem 3
50 rem 4
60 rem 5
70 rem 6
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
420
430
440
450
460
470
480
490
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510
520
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580
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600
610
620
630
640
650
660
670
680
690
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900
910
920
930
940
950
960
970
980
990
```


ON THE ST

Paul Woakes

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Reviews

SABRE LABEL/ SABRE BASE

Sabre Soft
8K Disk

Reviewed by Alan Goldshire

After Word processing, Databases are the most popular of the serious applications available for computers and file programmers and others keeping track of your debts and producing mailing labels make high amongst people too. Sabre Soft has brought us a product that effectively covers both of these requirements. Both programs are for the XL, XE and 600/400 range and, requiring BASIC are available on a double-sided disk.

SABRE LABEL has three versions, Address Labels, Binary Labels (Disk Directory) and Miscellaneous Labels.

Setting up the program takes you only a minute, through the title screen onto a menu using an already chosen key which is quite readable. Selecting any one of the three versions will take you through a well planned and trapped procedure. The address section for instance will allow you to create a label of up to 80 characters wide and five lines deep. Editing facilities are available at all times with modifications as many points. Any number of labels from 1 to 100 can be printed using a range of different print styles. Labels can be saved to disk for future use and arranged with a word processor if required.

Of the other two options, Binary Label function will read a D001 2 or 3 disk directory with or without your choice of title and disk number and Miscellaneous Labels gives you eight lines to type in your own detail in any font. All labels may be saved to Disk and the program will accept binary codes inserted into the label area to configure individual lines of text to be mixed print styles.

SABRE BASE is a menu driven system to read data from your program disks or catalogue Binary or Main boot type disks. The main screen is made up of a number of items which allow you to input data, view, sort, search, retrieve and print data, create data disk, delete data, send data to ram file and set up RAM disk. Up to five different data file names may be held on each disk.

Without going into too much detail, this program will take all the hard work out of creating and maintaining a database of your programs on disk. With full sort, both numerically and alphabetically and a comprehensive search facility, the program even has prompt control. Sabre base will allow you the luxury of 'losing' the database to disk in an ASCII format suitable for copying onto most word processors.

The label program worked well indeed giving a range of print styles and control. I found the program well trapped and friendly to use. Sabre Base unfortunately proved to be difficult to load, my review copy could only be loaded through DOS. It actually took a couple of minutes to boot up, unfortunately I have no idea whether this was a design fault or the disk being corrupted however the program was well trapped and easy to use. The sort feature was a little slow, it took two minutes to alphabetise thirty-five entries, but the search facility was much faster taking only five seconds on average to find your collection.

Overall I thought the program was good value for money at only £8.95 for a double-sided disk with a surprisingly well written 54 page manual. Available by post only from Sabre Soft of Cambridge.

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THE ATARI XMM801 PRINTER

Fairly I would like to say that the appearance of the printer says a lot for Atari, it seems that they do listen, so as just a few months ago people were saying "You had now the ST range is out, Atari, and not show anything else has abandoned the 8-bit arena, and when the ST range appeared I must admit that I thought the same. But no, Atari have proved us all wrong and the appearance of this particularly good printer will hopefully herald Atari's return to the 8 bit range.

Visual view of the Atari printer has been rough and ready affairs so what would make you go out and buy another one? Let's have a look at the other printers still available from Atari and then go on to discuss the merits of the XMM801.

The 1025 looks and behaves so much like the Commodore MP880 for my liking, as they are together with an Amstrad model, the same design with the rollers inside the printer allowed to roll. It can do screen dumps, with the right software, it is compact and functional and, although the print quality isn't great, it is okay if you use a case ribbon every 20 or 30 pages. It is however fairly old technology and so runs at a page a minute of around £100 or less which is excellent for any dot matrix printer. The 1025 will suit any youngsters who want to use it for screen dumps and those who want program listings and are not too worried about the overall look of any text processing they do.

As for the 1027, will have Atari get themselves mixed up as they I don't know. It works okay if you use fairly heavy paper (I use 80 grams photocopy paper) and you may even get your print as fairly straight lines even if the size! But my first belief that Atari should be concerned on replacing this, rather than the 1029 because, although the XMM801 is a fine printer it is not a Letter Quality printer. I suppose though that the one thing in the 1027 is slower as a printer so neither are Letter Quality printer comes remotely near the price.

So on to the XMM801 which is a beautifully designed and worked machine. It matches the 100XE perfectly, being the same shade of grey even so more boldly with a black translucent cover. The cover is, unfortunately, quite difficult to see through so you may miss it if you wish to see the printer is fairly quiet anyway. It remembers to replace it after one though as it is primarily a dot cover for the delicate machinery inside.

There are a set of 3 keys and 1 LED on the top of the right hand corner which are, from back to front, Power, No Paper and On Line. In front of the On Line being a key which acts as a toggle between on and off line with the LED glowing when the printer is ready. There are Line Feed and Form Feed keys as lines which are disabled when the machine is On Line. The dimensions of the printer are 4) inches (11mm) high by 19) inches (484mm) wide and 13) inches (330mm) deep. It weighs less than 12 pounds. With



reviewed by Rob Anthony

only 8 pins on the head it manages to do 9 columns and the head can survive over 30,000,000 characters.

The new printer is virtually an Epson. The manual tells you to not dumping these comparisons in this printer should not prove too difficult as several screen dump programs have been published in magazines over the years. Be warned though that several printers that claim full Epson compatibility are often only 95% compatible and would hang on some commercial programs. I have not had the opportunity to test this on every program on the market!

Either friction or tractor feed can be used but if you want to use thick rolls you will have to get yourself a pair of screens as there is no paper support facility on the cover or elsewhere. An unusual feature, which it shares with the 1029, is that the plastic lid covering the platen path up from the back in the front making it necessary to remove the cover to replace ribbons. As the cover has no practical function other than a dust cover, perhaps it would have been better to have hinged it at the rear.

None of the faster printers are the same ribbon. The ribbon for the 1029 is fairly easy to get hold of, at £1.95 from Boco, and although the manual says the XMM801 ribbon is preferably dropped, it should also be pretty standard at around £2 or less. An interesting feature about the machine is that it prints direct onto the platen so that a load on the ribbon will not give it a longer life. Ribbons for the 1029 and XMM801 can be ordered at about a third of their cost if you can find the right company to go to. The XMM801 also comes with a carbon ribbon which allows exceptionally high quality print but which of course has to be thrown away after one run through.

To load the paper, you need the paper release on the front of printer, high, but to use the tractor it must be in the low position. You will need fairly slim fingers to change the paper easily as the lever is spaced between the cover and the edge of the carriage, and you don't cut yourself on the metal paper guide! All that was needed to fix this problem was for Atari to put a small handle on top of the rollers. There is a no entrance to have the changing the ribbon and the gear head is fairly tight against the platen.

If you want to use single sheets you will have to double

ADJUST IT!

As a follow-on from last issue's Speed Check program, let's take a look at the symptoms of an incorrect drive motor speed, several ways of testing it and ways of adjusting it.

Symptoms

As you are probably aware, an 800-format disk contains 40 tracks. Each track is divided into 16 sectors of equal size. Each sector has 256 data bytes - this is the data that you normally read or write to disk. What you may not know, is that there are a number of extra bytes at the beginning and end of the data bytes. These are not accessible to us, but are used by the drive's disk controller for indexing track numbers, sector numbers, cyclic redundancy checks (similar to checksums) and various status bytes to ensure the integrity of each sector. In addition, each track has an extra very narrow 'sector' track so as to define the start of the track.

All this information is written to the disk when it is first formatted. However, if the disk is spinning too fast, some of the important bookkeeping information may be overwritten. This results in improper formatting which might not be detected at formatting time. This will show up as a loss of data with the occurrence of Drive Data Errors (DDEEC 144). A fast drive may also have trouble writing to a disk formatted at a slower speed, as it will overwrite the space allocated on the disk.

On the other hand, if the drive speed is too slow, the data will be pushed closer together and becomes hard to read by a drive operating at normal (or fast) speed. You may not be aware of this problem, and somebody with a faster drive has trouble trying to read your disks (although slow drives can usually read data formatted at faster speeds). The most likely C or D errors in the system are the files that are likely to fail due to the closer packing of data.

Other errors may also occur, but these are the most common.

Testing

You should test the speed of your drive at least once a month. If you use a floppy, then increase the frequency of the test. A commercial software developer should probably test a new 'write' file as often as possible to check the speed before a formatting session, as this is when it is most critical.

Keep in mind that drives tend to spin faster when they are first turned on and slow down slightly as the internal mechanisms warm up with use. You should therefore test the drive's speed at a time most appropriate to your usage habits.

I am aware of 3 different ways of testing the disk motor speed. The first method is the one used by Acorn as explained in their service manuals. For example, see pages 7-9 in 7-10 of the Atari 810 Service Manual. This method requires some heavy equipment (such as an oscilloscope) which makes it impractical for the average user. It measures the disk speed indirectly by measuring the voltage travelling from the drive

Did you check out SPEED CHECK last issue? If you have problems with your drive Garry Francis now tells you how to adjust it.

motor's generator. The measured value is then compared with the optimum value listed on a table. If it differs, then the speed needs adjusting.

The second method is to use a microscope. The manufacturers of disk drives often include this on the flywheel of the drive. In the case of the 810, if you remove the top and bottom caps of the drive and turn it upside down, you will see a large circular hole in the metal housing. Through this hole you can clearly see the flywheel which the drive belt passes around. Attached to the flywheel is a microscope with two concentric rings of markings. The innermost ring is marked '60' for 60Hz power supplies such as Acorn's and the UK. The outermost ring is marked '50' for 50Hz power supplies such as the United States. You will note that they differ in the number of markings. The 50Hz scale has 20 markings and the 60Hz scale has 24.

The microscope works by flashing a light on it while the drive is spinning. The flash rate should be the same as the power supply (i.e. 50 times per second for Australia and the UK or 60 times per second for U.S.A.). A fluorescent light is usually good enough to do the trick. If the scale appears to be stationary, then the speed is correct. If the scale appears to be slowly moving, then the speed needs adjusting.

Unfortunately, in the case of the 810, some quick calculations reveal that the microscope is totally useless. The reason for this is that the drive was originally designed to spin at 300 r.p.m. (and the microscope designed to see it, but Acorn have adapted it to run at 288 r.p.m.)

I tried making my own microscope to see the 288 r.p.m., but it proved to be a huge flop.

The third method is, of course, to use a software-driven speed meter such as Speed Check from last issue. You don't have to disassemble your drive, it does not require any extra hardware, it is reliable and it is comparatively simple to use. See last issue for complete details.

If any of the tests indicate that your drive is operating at the maximum speed, then you'd better correct it quickly. There are two options open to you. You can take it to your nearest Acorn Service Centre and get it fixed by a qualified technician or you can fix it yourself.

ADJUSTING DISK SPEED

Adjusting the drive speed is a ridiculously simple job. If you follow the instructions below, you should have no trouble. There are already thousands of users adjusting the speed of their own drives.

There are only two points to keep in mind. Firstly, clearing your own drive may void any warranty you have on it and secondly, neither the author nor PACE & will accept any responsibility for damage you cause if you do the wrong thing. Use your common sense. If you don't feel confident of adjusting the speed, then don't do it! Take it to an authorized Atari Service Centre.

The Atari disk drive has had a turbulent history, in which it has gone through a number of changes. The original Atari 810 was plagued with problems from the day it was introduced. To a man's credit, they made several modifications to improve the drive's performance, including a revised file management system (DOS 2.0), the addition of a data expansion board and the Revision C ROM chip. If you have one of these early drives, see the instructions given under "Early Atari 810".

After a couple of years, an extra powered circuit board was added to the framework above the read/write head. Its function was to regulate the disk motor speed. This was an improvement over one of the drive's most common problems - a tendency to drift from the correct speed. If you open up your drive and find that it has one of these boards, then you should use the instructions given under "Late Atari 810".

In the May/June '85, Atari replaced the aging 810 with the latest profile 1050. If you have one of these drives, then use the instructions given under "Atari 1050".

Before you start, you will need:

A goody bladeed knife

A medium sized Phillips head screwdriver

A medium to small sized tin screwdriver

A copy of Speed Check

About 10 minutes of your precious time

Remember that all tools are first of importance. If a screwdriver can't pick up a single pea or staple, then it is impregnated!

EARLY ATARI 810

- 1 Prepare a clean, dust-free environment to work in. Every bit of dust, lint and other foreign particles can cause damage to the disk drive.
- 2 There are 4 circular self-adhesive tabs covering the screws in each corner of the top cover of the drive. Remove these using a goody-bladed knife or similar pointed object. Upon removal, these tabs take on a bit of their own life. They love sticking to dirt-covered and anything else that comes within range of them, so you then end up in a safe place.
- 3 Use a medium sized Phillips head screwdriver to remove the screws in each of the 4 holes.
- 4 Remove the cover by lifting it straight up and place it to one side.
- 5 With the cover off, take a good look around inside to familiarize yourself with what things look like and where they're located, but do not touch anything unless you know what you're doing.
- 6 Lying flat on the back of the drive is a printed circuit board known to the user board or power board. Locate the potentiometer labelled R340 on the back left-hand corner of the board. It is a plastic disc above 19-pin diameter with a slit through the centre. It is usually white or tan in colour, but some versions have painted circles that are blue.
- 7 Use Speed Check. It is okay to run the drive with the cover off, but be careful not to touch anything.
- 8 Carefully place the disk screwdriver at the side of the

potentiometer without touching any other components.

Turn the potentiometer clockwise to slow the drive down or anti-clockwise to speed it up. You only need to turn it a tiny amount.

9 Check the test results being displayed on the screen by Speed Check. If the results are not consistently at the green region, then repeat step 8 until they are.

10 Replace the drive cover and check the test results one more time before screwing it in place.

LATE ATARI 810

1-3 As for the early 810

4 These drives are identified by the extra printed circuit board mounted above the drive mechanism. Locate the potentiometer labelled R340 which should be to the left of the only integrated circuit on this board. It is usually green with a small screw head protruding from the top.

7-10 As for the early 810

ATARI 1050

- 1 Observe the precautions outlined in 1 above.
 - 2 Remove the power and I/O cards.
 - 3 Turn the drive over and remove the four corner screws at each corner together with the two at the front holding the front plate.
 - 4 Turn the drive angle way up and remove the top cover by lifting it from the back and sliding it forward to disengage the front plate. It is important to move the front plate forward as you may otherwise break the plastic lugs supporting the front plate to the top.
 - 5 Follow the precautions in 1 above.
 - 6 The potentiometer is a small blue upright bar on the left (as you look towards the rear) side of the circuit board at the back of the drive. It is labelled R41. There is a small screw on the top which may be covered with some sort of sealant. If so, you must slip this away carefully with a sharp screwdriver or knife. Be very careful! The sealant is quite hard and is easy to slip and damage other components. Take your time. This is the only step where a heavy hand could cause damage.
 - 7 Carefully re-insert the power card and I/O lead, switch on and run SPEED CHECK.
 - 8 If the result is Speed Check above a variation of speed from 2880 rpm, insert a small screwdriver in the screw on the potentiometer to adjust the speed. Turning anti-clockwise will slow the drive down and clockwise will speed it up.
 - 9 When you are satisfied, switch off the drive and replace the top cover by placing it on the drive with the front overlapping and then sliding it back, ensuring that the two lugs on the bottom of the front panel engage with the slots on the case. Finally turn the drive over and replace the screws.
- If on any model you find that you cannot achieve the correct speed to the speed check or it consistently slow shortly after adjustment, then you may have a bad drive problem. This could be due to a stretched or incorrectly positioned drive belt, a bad main motor circuit or drive motor repair, the drive motor tach line is out of phase or the spindle bearings are failing. In any case, take your drive to the nearest Atari Service Centre for repair.
- Good luck!

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LIST

1029

by Eddie Cross

Anyone who purchased the 1029 printer in table form to do dot programs will almost certainly be disappointed as this is does not print anything like the full range of characters that appear on the TV screen. All is not lost, however, as the 1029 is capable of both the Image Mode and International Character mode which together can be used to print those 'unprintable' characters.

The accompanying program can be used to print any program that has been LISTed to disk and will show all control characters as well as reverse characters in much the same way as the listings in PAGE 5. The program is to be printed out in a LISTed form on disk. Just run the program and follow the prompts. The length of line for the printer is requested, defaulting to the normal screen width of 80 but this can be changed. The number of lines per page can also be readily altered. Even the distance to be printed without using CR is questioned. The program will default to drive 1. When the file has been located, the screen is cleared off and printing begins.

Once the number of lines per page has been reached the screen is cleared on and the message 'NEW PAGE' appears. You may now adjust the paper or insert another sheet before printing RST & RN to continue.

The listing is often from the left margin by using a standard tab(7,) so line 100 which will allow for hole punching, for storage and the page heading and page numbering is printed in double width.

For those who would like some more information on how the program works I will provide some brief notes.

FORMING CHARACTERS

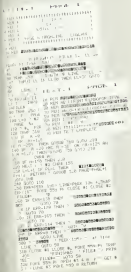
Firstly it is important to understand how characters are formed in the Image Mode. The printed character is made up of a matrix of 7 dots high by 7 dots wide (compared with a screen width of 8 pixels high by 8 pixels). In the Image Mode it is possible to address single dots within by column. Standard binary is used but as the matrix is only 7 dots high only a maximum of 127 can be used in each column. This would give a full vertical line.

Each of the 7 columns is constructed as follows:

Top dot	64
	32
	16
	8
	4
	2
Bottom	1

To construct a line of dots in the first column of any, the top, second to bottom and bottom rows, simply add up the

continued overleaf



values for each row and write this as a DATA statement

10 DATA 68

Now repeat for all five columns to build up the necessary shape of the character:

10 DATA 68,111,65,11,127

An additional point to note is that although the 1029 uses five columns for a character it normally also prints a sixth blank column to separate the characters and this may be dropped in order to use the Bit Image Mode to print alternative characters. So, a fifth line of dots (in this case no dots) must be added so the data must read as 0:

10 DATA 68,111,65,11,127,0

BIT IMAGE MODE

To put the 1029 in Bit Image Mode it is necessary to send the code ESC ESC A to the printer. This must be followed by the Move Signatures (M) (MSB) and the Least Signatures (L) (LSB) denoting the number of rows of data to be sent to the printer. In this case, since we have only 5 rows of data the MSB=0 and LSB=0

The command for sending the Bit Image data is in lines 100 to 410 of the program

Line 100 sends the instructions to Set Bit Image Mode, MSB and LSB

Line 110 sends the DATA line that contains the message to be printed. It is 1029 plus the ASCII code for a particular character. For example, the ASCII code for lowercase CONTROL B is 130 so line 1130 contains the data Lines 100 to 410 send the DATA statement and print the individual columns of selected data. Line 410 returns to the main program to load the next character to be printed

INTERNATIONAL CHARACTERS

As much of the 'non-standard' characters but there are in fact several characters that the 1029 can print without using the Bit Image Mode and constructing DATA statements. These are included in the 'International Character Set' and include such characters as 'blue screen' and 'various screens'

These can be printed simply by putting the 1029 into International mode by sending the codes ESC CONTROL-W to turn on the mode and ESC CONTROL-X to turn it off. Line 150 of the program does this

The heart of the program lies between lines 130 and 130. Each character to be printed is read from the data (LINE #1-A) and the ASCII value is checked. If the character is not one which can be printed normally, the program goes to the subroutines for either Bit Image Mode or International Mode as appropriate. If the character is standard the program continues to line 200 where it is printed as normal

One single dot which is often some characters, being normally 8 bits wide (is divided) to fit into a 7 bit screen so the sixth bit has to be used and the spacing is lost. The results however are still quite legible

I hope that 1029 owners will find new uses for their printer with the information in this article and program. It should be quite simple, for instance to print the character Z again with a little thought. Remember it is ASCII code 90 or CONTROL-H in International mode

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SUPER 3D PLOTTER II has received wide acclaim and excellent reviews. Here are just a few:

- ★ "SUPER 3D PLOTTER II is useful to people like me who find fascination in seeing wire-framed images rotate, or who want print-outs of line drawings from different perspectives." *Lon Dorfman, Atari, August 88*
- ★ "If you are looking for a comprehensive graphics package, you won't go far wrong here." *Andy Moss, Popular Computing Weekly, 15-16 April 88*
- ★ "Truly software with imagination." *Matthew Tydeman, Monitor, September 88*
- ★ "It really is quite easy - I managed to produce a correct 3D image in the first attempt." *John S. Davison, PAGE 5, January/February 1987*

WHAT
SHOW

Review

SUPER 3D PLOTTER II

Reviewed by John S. Davison

The always-famed computer manipulation and display of three-dimensional images has come to reach The \$29.99 package from Duxton Software brings the capability to say it has been with 48K in mind, it slides down, and a joystick. Optionally, you can use a printer to produce hard copy of your 3D images.

BETTER PACKAGING NEEDED?

My first impression of the package was a favorable one. The cheap plastic packaging and the notes printed in past editions manual on quality green and yellow paper did little to convince me it was anything quality software. The bright green(?) double-sided disk and prior quality keyboard reference card didn't help either. Duxton Software have indicated however that they are improving the packaging and providing a fully revised manual which I feel is essential for any software in this price.

DISPLAYING IMAGES

Booting up the disk produced a message saying that the program was on side 2. Side 1 contains data files - *learn...difficult... anyway?* The program's driven by a combination of mouse releases, keyboard function keys, and direct joystick input, depending on what you're doing. The mouse menu, but its position worked surprisingly well. In fact, I found the user interface to be surprisingly friendly.

The manual is written mainly in the form of a tutorial, and starts you off displaying and manipulating 3D images supplied with the package. Some of these are fairly simple, such as a cube, while others, like the aircraft and TIE fighters, are considerably more complex.

Choosing 'Load' from the main menu produced a listing of the image files held on the disk. Selection of one of these resulted in a screen display showing a 3D wire frame image of a battleship looking straight at you, positioned as if flying out of the screen towards you.

Control keys let you switch between high, medium and low resolution displays, produce black or white, or white on black display in high and medium resolution, and cycle background colors in low resolution mode. My preference was to use a black image on white background in high resolution mode.

Using the keyboard, you can then rotate the image about the X, Y or Z axis. This is done image can then be rotated from any angle. Rotation is 'static' in that once begun it continues, moving the image around the chosen axis a few degrees at a time while you watch. Speed of rotation may be continually varied by keyboard control. Maximum speed is prevented by complexity of the image and resolution of the display. An example is paid in 4-view mode, the aircraft rotated completely about the chosen axis in about 25



seconds, at about 2 screen displays per second. Incidentally, there's no choice as to the image or red frame.

You can actually freeze the image in any position, or slow down, or reverse the rotation as required. Also, you can rotate the image about any one, two or all three axes simultaneously, making the image 'wobble' on the screen as if in zero gravity.

A clever feature of the program is that as it rotates the image, the correct perspective is maintained. So if you rotate this in such from its original position through 180 degrees so it appears to be flying away from us, the tail fin now appears much larger than the nose. This gives the eye important visual clues as to the orientation of the image. A wire frame graphics can be very difficult to reorient so about this.

Two more parts of the control system deserve comment and explanation. Both control the size of the image on the screen, the former giving a gradual 'zoom' in or out effect, while the latter enlarges or reduces the image by a factor of two at each key depression, and alters the perspective effect. By using both together you can produce a perspective to suit your preference.

SOLID IMAGES

The program has the ability to 'remove hidden surfaces' from the displayed image, giving it a more 'solid' appearance. In effect, it removes the lines at the back of the image you can't normally see. In a wire frame type image these are so seen all the time, of course. The only snag is, there's a lot more processing involved, so the speed of rotation is reduced by about half.

After removing hidden surfaces you can have the entire image color filled. This, surprisingly, seems to make little difference to the speed of rotation, but gives the image an even more realistic appearance. In medium and hi-res modes, three shades of fill are available, namely black, white and an unselected pattern. In low-res mode, the image is filled with green, dark blue and purple, while the background can be set at any colors you like. As with the packaging, that wouldn't have been my choice of colors, but does clearly delineate the different surfaces of the image.

continued overleaf

IMAGE TRAILS

Normally, the program creates an image before deleting the first one in a rotation sequence, but you can turn off the erase function. This results in a trail of images on the screen, leading to some fascinating "computer art" effects. The effect can be further enhanced by switching into "Exclusive OR" mode, which changes the color of new overdraws and also by offering the user the use of rotation from their normal "view" preview.

Saving a complete screen as a Macropainter format is possible at any time. You could then load it into an art program, screen dump program, or other picture file utility for additional processing. A further feature lets you load a Macropainter format screen into the program as a background in your image.

These features give clues as to the possible practical uses for the package. How about drawing a simple 3D shape, encapsulating it to get the best viewing angle and perspective, and then loading it into an art program like Micropainter for adding detail and background work? Or running off the error function and doing the same thing with a trail of images? This could be a great help to creating computer artists, and could also be a big time saver.

CREATING IMAGES

The natural process is by showing you how to create your own images, beginning with advice on how to prepare an image for input. I've been able to use really heavy to produce a paper and pencil drawing first, and work out the X, Y, and Z co-ordinates of the important points, and connecting lines between them. This can be hard work for a complex image!

Having defined your points and lines you can enter them in one of two ways. The "fast" way is to use the Interactive Graphic Editor, which lets you draw the image on the screen using trackball (and occasional keyboard) input.

The second way goes through the drawing of a cube within the cube through its center. At first sight, even the simple example looks daunting, but in practice, using the Interactive Graphic Editor, it really is quite easy - I managed to produce a correct 3D image at the first attempt.

The interactive editor uses a rubber banding technique for line drawing, like that used in most art programs. It's also funnier plus the fact that the program tells you when you've connected with an existing point which makes accurate drawing possible. For real accuracy, though, there's another way of creating images, and that's by using the Data Editor. This sets X co-ordinates and point connections and also fills in a table to calculate the images you're doing. The "making it happen" to do the paper and pencil drawing first. Either editor can be used for changing existing images, in correct situations, for example.

Following basic image construction techniques, the natural next one is to create more advanced features of the program, such as creating surfaces rather than lines, so you can say the hidden surface removal facility, mapping of multiple images, and use of screen overlay facility. The manual also includes details on the individual aspects of the program, such as the mathematics used in calculating the 3D image rotation points, and how it was programmed.

PRINTING THE IMAGES

Two image printing facilities are provided, both

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standards for use with Eplus compatible printers. The first of these is designed to work only with 6-dot per inch dot-matrix, and produces an A4 size print out. The other works in medium or heavy, with both dot-matrix resolution and/or colour fill if required, and produces a program filling one quarter of an A4 page. Both produce hard copy of good quality.

A BASIC program included in the package enables you to modify the print functions to suit your printer. It also, as you did, as any Super 3D is a Super compatible, and worked happily without change being necessary. However, the BASIC program looked quite straightforward to use, assuming you knew the control codes your printer needs to reach its own graph mode.

CONCLUSIONS

After being put off initially by the packaging, I grew to like the programs. I was impressed by the ease of use, thanks to a good user interface and clearly written manual (despite the awful colors, spelling mistakes, and few mistakes here). I was also impressed by its reliability and performance. So, despite the 16-bit ST could make a look ally, but considering the limited size of the 8-bit workstations, I think the authors have done an excellent job.

For £29.99 I certainly expect better packaging and presentation, especially as for the interactive manual I concerned. Indeed, the program deserves far better. The main, Super 3D Flight II should give you hours of pleasure and enjoyment if you're interested in exploring the world of three-dimensional graphics. With the present packaging and improved manual my only major concern will be success and I can certainly give the program my full recommendation.

SHORT REVIEWS



A WHOLE HOST OF SOFTWARE REVIEWED FOR YOU BY JIM SHORT

RAID OVER MOSCOW

Access Software/U.S. Gold
48k Disk \$14.99
48k Cassette \$9.99
1 Player
Joystick

This one started for me as a perfect time to coincide with the Moscow Arms summit in Iceland. Perhaps there's a moral to that somewhere? Anyway, the title of the game (rather than the content of the game itself) caused quite a stir when released on the Commodore, so much so that it was retroactively threatened to plant old 'Rad, Personality, the war done as it not to upset the Russians, though it's doubtful whether they've ever heard of the game! Now the fun has died down, it's back to the original title for the Atari release.

RAID OVER MOSCOW is a strategic shoot-em-up covering several different scenarios. You play the part of a Russian leader who leads a suicidal counter-attack on the Warsaw pact after those nasty Pedro Lofly Reds have dared to invade a sensitive track on Good Ol' America.

The opening sequence is a world premiere from S.A.C. Headquarters with the message identifying the Soviet missiles and their launch site. Luckily, your aim is to attack and knock out the launch site and halt the action wherever over to the U.S. Space Station where you attempt to launch one of your Stealth Fighter Aircraft to eliminate the attack. Whatever happened to 'Escape, they did' tonight a Star Wars Defense System? - well, I forgot to tell you, the United States have apparently dismantled all their nuclear weapons (a likely story).

There is one priority to spare (how a lot for a game of off-the-wall strategy), so usually getting one of your aircraft out of the spot causes it quite trouble. That too - after about 90,000 hits you'll eventually get the hang of it and you'll wonder what all the fuss was about!



Clear events, you pilot a cruise to the launch site and then the action changes to a 3-D Escape-like display as you push your plane towards the missile site, avoiding enemy missiles and steering down the odd helicopter as an. The game's pretty easy after the basics of the space-game.

When you reach the launch site you are confronted with a head-on view of the missile site. The large center site is the important one. Knock it out - but you'll have to dodge some heavy fire and destroy defending aircraft to do so. Another crap screen. Complete this and the whole process has to be repeated three more times before you can advance to the city of Moscow.

In the end you quickly ditch your plane and assume the role of a combat soldier armed only with a military grade launcher. Here you must blow your way into the main reactor room, which is situated at the level of the Kaminski (what a crazy place to put a nuclear reactor's) Eight-eyed Russian weapons make this a particularly difficult phase of the game.

Fortunately, the hardest phase of all has been saved until last. Your ultimate task is to sabotage the reactor by breaking out the guardline robots with your disk grenades. Unless you're those disk grenades as they seem to go every-

where except where you want them, off. To cap it all the robots are susceptible to a thermal attack and have to be caught on the 'holocaust'. There are no robots, each requiring 4 hit spots, which is probably why I've never managed to complete this phase and blow the reactor to smithereens, or whatever it is in the Yanki-speak of my youth!

I would prefer to bring the game down a bit. The different scenarios give a varied interest and potential it from being just another boring shoot-em-up. As for the controversial element - a detail I disagree with me. As to how did I feel as if it was a Global confrontation and it may as well have been called 'Raid Over Mecklenburg' for all the difference it made.

I feel sorry for all those silly people who reacted on to a serious popular computing magazine in an effort to make a political issue out of the game (Okay, so they were Comm. Members, but it's not that good enough reason). In the standard words of Jim Soap - 'It's only a game'. Anyway, nobody complained about getting the biggest when 'Reverend On Friendship' was released, now did they?

**PREPPIE
Americana**
48k Cassette \$2.99
1-2 players
1-2 joysticks

At one time Atari owners would have paid almost \$50 for a copy of PREPPIE and will understand it a bargain now. This old favourite has been re-released on the budget Americana label at only \$2.99.

Based on the arcade game, Preppie is quite fun in a way of Wadsworth Overton, an enthusiastic Preppie (American for 'schoolboy') who has been out to work relieving wayward girl balls on the infamous 'Nasty Nae' - the

world's most treacherous golf course Hazards abound in the form of deadly lawnmowers, golf-carts, builders, logs, snakes, crocodiles, snakes and even a gatorcrocifer frog!

Back in the good old days, FREDDIE was an adaptation to a translated Atari console in the form of multiple colours on screens at the same time. These days many programs feature "Rainbow" colour bars using D.M.T., but Alan Weinstein, author of FREDDIE, used the colours so such a way as to make it seem as if the Atari had a 16 colour graphics mode. A unique achievement and, to the very day, no 8 bit game can boast the colour range that FREDDIE has - over the whole screen features text in 14 different colours!

FREDDIE also broke the record books, being the first game (to his as I can remember) to feature music in 2-part harmonies using proper studio, vintage and decay envelopes. Yes, these were the days folks, with everybody going around whistling the FREDDIE tune like it was Number One in the Top Forty. Four years on, the FREDDIE music can still hold it's own against the very best of computer sound tracks.

The game has a lot of humorous touches, such as the way Freddy gets squashed to his knees for normal size enemies to collide with a moving object. The original game also had some pretty neat movement, which included a recessed tale of Wadsworth's life story. Also, there have been versions for some thing a little more in line with the new budget package.

Again from that, it's mainly the name FREDDIE of old and, once through it is showing it's age somewhat, no software collection is complete without it. I read somewhere that FREDDIE is the biggest selling Atari game ever. If it had been priced at £1.99 as it is today it would have been the biggest selling computer game of all time, no over? Buy it now and show all those Commodore owners what full colour graphics can all about!

ORB OF ZABRAMIER

Programme
4th Disk £19.95
4th Cassette £19.95
1 Player
 joystick



The scenario for this game could like a passage from Lord Of The Rings. Don't be deceived by the rather over-

imaginative script packaged with the game instructions, as ORB OF ZABRAMIER is a simple adventure game to master from with simple graphics to match.

You guide a small character through countless rooms, treasure chests, searching for the magical orb which has been stolen by the Dark Lord. Gold, weapons, and treasures can be collected along the way, but watch out for the Wraiths which guard some of the rooms. Poisoning berries are a regular occurrence and these have to be negotiated properly in order to advance through the rooms.

Interestingly, it should be possible to go about your search in a logical manner. Drawing a map is advisable, as I tend to do things blindly from memory and ended up running around in circles! Completing the ORB will probably be a long drawn out process but, like most adventures, you can save current gameplay to disk or tape and reload it again at a later date.

This is a difficult game to rate up. Two adventures will keep score so it is a reasonable play, while arcade lovers will probably find it too boring to even bother trying to complete it. A nice idea, but the graphics could have been much better considering the Atari's potential. To see a well-made adventure is quite a try before you buy!

SIDEWINDER

Programme
4th Disk £14.95
4th Cassette £9.95
1 Player
 joystick



This screen is dedicated to all those agricultural engineers and those who find most computer games far too easy to challenge their skills, and have been looking for a decent game to get their teeth into, or their fingers fingers at any one time, you lot - SIDEWINDER is the one!

It's been described in other less illustrious ways as a sort of horizontal Caverns Of Mayn' but, to reveal that, it is more than a helicopter version of Asterix.

In the game you are the only survivor of a team of cock agents sent underground to capture SIDEWINDER - the very latest in helicopter technology. In order to escape you must fly SIDEWINDER to freedom through a maze of caverns guarded by an army of frenzied defence and security systems.

SIDEWINDER has a fuel con- compass along the base of the Spear

Shank, so you must continually shoot or bomb all the fuel pods you encounter to keep the chopper airborne. This is particularly significant as there are no 'ferry' involved in the game so each time you lose a chopper it is immediately replaced with another - but the game is over when you run out of fuel.

SIDEWINDER is similar to Colibri's "Waduk" in the sense that you have to reach a landing pad at the far end of the cavern system and then return to the landing pad at the beginning to advance onto the next level of play. When you lose a chopper you are penalised by having to convert all the way back to the previous landing pad. Practising is one word which springs readily to mind here, but there must be a better way to describe SIDEWINDER. Any ideas?

An added bonus is the SIDEWINDER EDITOR which allows you to design your own Sidewinder screens and save them to disk to create your own customised version of the game. Prizes were once offered a prize for the 3 best designed screens but, as SIDEWINDER has been available for some months now, the closing date for the competition has long since expired.

Despite the fact that you no longer have the option to win an Atari pin set done, SIDEWINDER is still an excellent package. If you like your games H-A-R-D then this is the one for you.

QUEST FOR THE MALTESE CHICKEN

Programme
4th Disk £19.95
4th Cassette £17.95
1 Player
 joystick



A parody of the Bogart picture you know "The Maltese Falcon", QUEST FOR THE MALTESE CHICKEN is a wily little platform game with clear, colourful graphics, a catchy title tune, and just about the correct level of playability - at least for you're truly to cope with!

Dearest Bogie has taken on a new task - to retrieve the fabulous Golden Egg of the MALTESE CHICKEN which it lays only once every blue moon, or every time Oscar returns to Ann page - whatever comes first! Bogie has faced the chicken to it's momentous fate and, to reach it, he must first pass through the underground Blackened Caves, dodging fire, fire-balls, cobwebs, snakes, snakes (snakes in snail-shell form but not quite so ugly,

mates, and even killer balloons, while looping across gaping chasms in his quest for that elusive egg!

Energy begins at the top of each screen and must make his way to the rest of the screen, collecting several birds along the way which eventually give him access to the next screen. There are 5 different screens in all before he locates the egg and then advances to the next level of play. Just to keep things interesting, more and more advancements are added as the levels progress.

As good as Salamander is, I rate the MAITSE CHICKEN as Salamander's best game to date. All credit to them for supporting the Atari and let's hope they continue to do so with games of this quality. Play it again, Sam!

SCREAMING WINGS

48k Disk (\$25)
48k Cassette (\$25)
1 player
1 joystick keyboard



Let's do this screen back to front for a change, shall we? I'm going to start off by saying "Buy this game now!" If you don't, you're going to miss out on the finest, most epic shoot-em-up on the Atari since the brilliant Defender.

An aerial glimpse of the not looking screen, disk version, left me with the feeling that this game was going to be something special. I wasn't to be disappointed. SCREAMING WINGS is almost identical to the arcade game, 1942 and puts you at the controls of a Lockheed Lightning fighter plane as the battle-worn leader Pacific during World War II.

The screen view looks down on the action from above, with continuous vertical scrolling to the same control as Asterix, Disk and other such games. From "Star" and you are catapulted from the deck of your fleet aircraft carrier straight into the thick of the action. The joys will be you with everything they can, including handsome Zero fighters which have to be you like heart-breaking machine! These powerful ones "loop-the-loop" to avoid them.

Collect the 'N' explosives for extra firepower and the 'D' explosives for a special "Mastertron" bomb which destroys everything in sight. An enemy aircraft appears at random intervals. It flies in front of you for a limited period and acts as a shield, making your plane invulnerable to enemy fire. If you make it back to your carrier, there's a handy hint:

to press the bomb before being catapulted out again to face the same wave of Zeros!

Everything about this game screams power. It has great graphics, realistic sound effects, and exciting background music which can be turned off if it disturbs your concentration. Anyway, why am I wasting my time here when there is a war going to be won? These days Mega never goes up, do they? Results at 11 o'clock high.

WAR-COPTER

48k Disk (\$25)
48k Cassette (\$25)
1 player
1 joystick keyboard



This game from Red Rat combines skilled strategy with arcade action to form an intriguing new war game.

You can make attacks from a neighboring country and, as a result of a previous confrontation, your defenses are now very weak. Your enemy needs powerful weapons to attack your main base and your only hope lies with the heavily-armed and deadly Lynx helicopter which is at your disposal. You must deploy it against the attacking surface ships and missiles.

The game features four war scrolling as you guide the Lynx into battle, making counter-attacks against the enemy weapons and utilizing the new controls which your armaments factory needs to produce more weapons and ammunition.

Your inventory tries to protect your own base, but your primary objective is to attack and destroy the enemy's underground harbor and achieve final victory.

Apart from the usual joystick commands, various keyboard options are required to operate all the strategic functions, making WAR-COPTER quite a tricky game to handle at first. A good effort from Red Rat though - and top marks to them for an original idea. There's previous few of these about these days!

ROCKET REPAIRMAN

48k Disk (\$25)
48k Cassette (\$25)
1 player
1 joystick

Red Rat are stepping up their Atari support with a whole bundle of new releases plus the added good news that

several of them are aimed at the budget market. ROCKET REPAIRMAN is one of them.

You are stranded on the distant planet of Lunaria and, with the aid of your jet pack, you must explore the maze of underground tunnels for essential components of your zero-gravity jet. By returning them individually to the spaceship pad, you can assemble your rocket and blast off to freedom.

The controls are extremely simple and inadvertently breaking the rules will damage your spaceship and cause leakage. Newton's Gravity (sounds like an Italian restaurant!) and Quark's Phasors (wonder the critics and there will also drain your jet) if they control you. They can either be avoided or inter-related with your laser.

ROCKET REPAIRMAN doesn't beat any new ground, but in a computer world like this which I found myself playing over and over again as a bid to complete the credits and witness the grand finale. Do I have to tell you that I never quit managing it!

I could criticize the bland colours and the dull explosion when you are finally captured (it's more of a pop than an explosion), but that wouldn't be fair. At the asking price, it represents superb value for money.

NINJA Mastertronic

48k cassette (\$2.99)
1 player
1 joystick



I've heard complaints that there are far too many martial arts games about. Fortunately, the Atari market isn't quite as saturated with them as most other computers and there is inevitably room for another - particularly when it is of the quality of this latest release from Mastertronic.

NINJA - a unit of mystical Rambo - is the best to compare lessons. He is a man alone, on a life or death mission to rescue the Princess Do-Do who is held prisoner in the mysterious Palace of Poole. He will face many tough adversaries - who are the devil's exponents of the mystical arts - as he strives to save the Princess and, in addition to this, the most gallant of several clans which she has dropped and to whom she is to be given her worth. Yes, it's more responsible to please a Princess these days. You will take and learn to rescue them and they're not happy unless you win them with a few points as well!

Not content with having hands and feet which should be regarded as linked with the Eastern branch of Liverpool, Nishi has several weapons at his disposal such as a sliding Japanese sword, spinning death stars, and a throwing dagger. To balance things up, these weapons are also granted to his opponent.

Things look odd with one of these typically oriental names around - you know the kind I mean? - which, to my ears, sound as fanciful as a Max Bygraves LP. Nevertheless, it is easily on a world map of way and seen the mood for the rest of the game. The graphics are neat and not only complimentary of bright colours - a rare commodity on a high percentage of recent Asian games as new programmers can't seem to handle more than the regulated number of colours. Good, few mistakes are probably the fact that most people look like an idiot in games though - there's no point in having a punching, kicking, all-around Nishi if he never comes within all the equity of a empty Doh! - and the question here is well up to scratch. Not quite in the same league as System 3 Hyper's 'World Karate Championships' - but this is another entry and another review.

NINJA scores high on playability. The key command moves are less complex than on most other games of this type and the difficulty level is just about right too. In the initial stages the opponent don't put up much of a fight - a quick 'burst' with the old reveal and they usually go down for 'splitter' to be more accurately before your very eyes - but once you are having to tackle two and three of these brutes in a row you'll wonder if the Professor is really all that bright!

Although I don't feel the game itself, the instructions could have been better. For instance, you have to flip up through windows in the ceiling to gain access to other rooms, but the instructions don't mention this I spent ages wandering around like a lost-tipped idiot on the lower levels before I accidentally stumbled across the secret of these traps!

Minor nitpick: a games are improving with such new releases. These programs aren't fast learning the subtle bits of the Atom to produce top quality games at staggeringly low prices. Even at normal prices NINJA would have earned excellent value for money. At £2.99 you won't get a better bargain than this.

SILENT SERVICE

Microprose/US Gold

48k Disk £14.95

48k Cassette £9.95

1 player

1 joystick keyboard

Distemper approaching off the starboard bow. Clear the bridge. Tighten down the benches. David David David! ...

Humble apologies - I got over a slightly carried away there. But that's why to go over the top when you're playing the exciting new submarine simulation from Microprose.

The company are well known for their computer simulations, mostly of the flight variety, but they've retained underwater this time to produce what is, in my opinion, their best game yet.

SILENT SERVICE places you in command of a U.S. submarine patrolling the Japanese shipping routes in the South Western Pacific during the Second World War. It faithfully reproduces the role of a submarine captain to provide a level of realism and playability unmatched by any other game of its type.

Many different systems are available to you at the controls, but the foundation is to start off with a Torpedo/Don Practice run until you get the hang of the technical aspects of the game. After that, you're ready for a Full-Blooded War Patrol.

Recommending yourself with the layout of the submarine is the tricky part. The console tower in the control Room Screens across and, from here, you use the joystick to control all the other systems. In effect, this lets you operate the periscope, wander over to the bridge (when you're not underwater, of course), consult your maps and charts for enemy sightings, read the damage reports, view the Quartermaster's Log, and check all the various instruments, gauges and torpedo tubes. Different commands are entered on each individual screen and so you will require a good working knowledge of all these screens in order to operate the submarine smoothly and efficiently.

The first-time graphics are perhaps the main focus of the game. However, they're not included merely for artistic purposes but, instead, give the simulation an added sense of realism. Speaking of realism - just how tall you're using these 100 feet below the surface, hardly doing to breathe, listening to the sound of a diver's engine overhead and waiting in total life force to drop three nightmare depth-changes! When the time on the back of your neck starts on and the coast begins to bubble down your face, head I Breathe - fetch my breath bubbles

please? - now that's realism!

Taking up an essential part of SILENT SERVICE and you must plot your course to the convoy with great care (the same rule can be applied up to reduce the torpedoes) as some of these big destroyers are a bit hard at running a job to ground. You can take a closer (particularly at night) and attack the convoy on the surface, using the extra red buoys to line up your torpedoes, or you can attack from the relative safety of periscope depth. Either way, it makes little difference to the line torpedo-escape you will claim the destroyer to your presence, and it then becomes a cat and mouse game as you try to run to safety. As well as torpedoes you have a launch deck gun, but using that against a destroyer is the worst case of suicide I've ever witnessed! It's best used on the troop-carriers and cargo ships.

At the end of your mission you are awarded a rank based on your skills (or lack of them!) in a submarine captain. What happens, you may even get your name on the high score table if you're lucky enough - and good enough!

SILENT SERVICE has a soundtrack of speeches and orders which I can't begin to go into here or we'll be at it for a fortnight. The old Tinsie film game - 'Submarine Commander' - has just been reissued as a budget cassette release, but it is no match for the superb package from Microprose. The difference between the two is night and day. If you're looking for a simulation of this type, do yourself a favour and save up the woad cash to buy SILENT SERVICE. You won't regret it.

2 from BUG BYTE

QUEST FOR ETERNITY

Bug Byte
48k Cassette £3.99
1 Player
Keyboard



Another budget adventure from Bug Byte (and still the best). Like it a predecessor - 'Cloud Of Death' - and also written by Bruce. This might put a lot of people off, but it's actually quite a good adventure of its type even if the screen



upside is a little slow.

The scenario is as follows: You start out on a starship which doesn't seem to work so well. You must first get the ship operational and travel back and forth to various planets for much needed supplies and then try to find the mysterious loach which will transport you to the Chamber of Cosmos. Unfortunately, the teleport booth is 2000 light years away on a slightly nearby planet.

The game accepts 89 verbs and 162 nouns and, although it isn't quite up to Level 9 standards, it seems complex enough to test your average adventurer. At Bag Byte's Chicago prices it must be worth a look as the very least.
FOOTNOTE: Bag Byte keep mentioning the Starship on *Voyage IV* as all their game scenarios. It doesn't seem to have any significance and I wish they'd put it a rest as it's beginning to get on my nerves!!

LEAPER

Bag Byte
48k Cassette \$2.99
1 Player
Joystick



"The game you've all been waiting for" it says on the cassette label. What are they trying to say? Remember 'Leaper' from Imagination? Good talk to you - well game! No perhaps it's before your time. Well, the effort from Bag Byte is classical enough to be the same game.

There are certain cassette differences. New aliens have been created with real word-sounding names like Gribble or Grib-Grib (well that driving home who thinks these stupid names up please stop forever!) but, as in *Leaper*, the aim is to make your way to the top of the screen by jumping up through gaps in a series of evering horizontal lines. The aim here is to be avoided, but there soon is the major problem - falling back down through the gaps or (once you have fallen through not gap) you accidentally end up back at the bottom of the screen. Laugh - I can't buy a round of drinks!

LEAPER runs pretty fast even though it was written in Basic. I do wish Bag Byte would start writing their games in machine code. Basic must not work. Happy trails and Good game!

There's not a lot more I can say about the one. It might have used high words on something like the unrequited *Vu-23*, but the Area is capable of much better things. At least there's an mention of the Starship on *Voyage IV* this time, which is something to be thankful I suppose! ●

JOHN SWEENEY IS STILL ADVENTURING

**QUESTPROBE
CHAPTER 1 -
ADVENTURE 3**
Fantastic Four featuring
the Human Torch and the
Thing
Scott Adams/Adventure
International/All
American Adventures
48k Disk
\$14.95

I tend to enjoy Scott Adams' adventures, but, rather sadly, they seem to have been left behind by the other main adventure producers like Level 9 and Infocom. It was really hard to compare them with Infocom since they are designed to fit onto a 64K memory (quite from the pastures), but Level 9's adventures are written with the same consistency as Scott Adams', and they get better all the time. *Questprobe* features, if anything, inferior to the other adventures in the series.

With the picture turned off, *Questprobe 1* (The Hulk) normally gives interesting responses. The Fantastic Four has a three to four second response - what went wrong? (It gets even worse if you WAIT - the command WAIT is like 30 seconds or so nothing).

A response time of a few seconds can be quite acceptable, it is, for instance, quite common at Infocom adventures, but the difference there is that you know it is going to be worth waiting for the response. This, also is not true of The Fantastic Four 89, if the response from the adventure are 'I see nothing special' (even single word descriptions of a few things would be nice), 'I don't know what your name is (even for a word like PRINCESS, which is listed as a

vocabulary) and 'I didn't completely understand you' (you get this for nine the majority of responses, e.g. OPEN DOOR - both of which are listed as in vocabulary - and also in the same door as the Chief Executive's office, which you COULD attempt to open as The Hulk). But it gets even worse.

The adventure starts with the Thing stuck in a hot pot and the Torch nearby. You can switch between the two characters by typing on SWITCH. I have the Torch over the pot and need to get him to hit the Thing out. This didn't seem to be working so I checked the documentation, which is quite extensive giving long descriptions of the various heroes and villains at the time. Sure enough, the Thing weighs 500 lbs, and the Torch can get enough lift to carry around 100 pounds. By firing a jet from his feet, checked instead him, to see where speeds of up to 140 miles per hour. This sounded like it might be enough to jerk the Thing free from the pot, so I typed as TURN ON JET - I don't know how to BEGIN something - but I used TURN not BEGIN, and TURN is listed as the verb history! So I used BEGIN AND JET = OK, but all it did was switch me to being the Thing. It would appear that BEGIN is a synonym for SWITCH, and it was approved for word JET completely. This is hardly what one expects of a company which has been producing adventures since the beginning!

Anyway, I gave up trying to move the Thing that way, but did eventually discover how to save him from drowning in the hot pot. I also explored around the place a bit with the Torch and discovered how to walk the cat's paws. After a few hours I had not found very few locations, and obviously few entities (there to be probed). I was getting bored. I had now reached a point in the game where the

Things are stuck at the bottom of a shaft. Now the instructions say "Your computer is able to understand long, complex sentences such as 'CLIMB ALL THE WAY UP THE SHAFT.' That sounded real tight for my current problem so I typed it in. After my previous ineptitude with the game's inability to understand the simplest of English, I shouldn't have been surprised when it responded "Your sentence has too many elements for me to understand. Please simplify it." (Can we do them for this advertising?)

One final complaint — how come a can understand GIVE CANDLE TO THING, but not GIVE CANDLE TO RINGMASTER? I don't mind if he doesn't want it, but anything would be preferable to seeing "I didn't completely understand you" appear in the screen yet AGAIN! There is absolutely no point in having a rich vocabulary of hundreds of words, unless you program the game to understand a few more sentences than those already required to complete the game. It just becomes a guessing game as to which is the only valid sentence you can use in the current situation. This, combined with the atrocious response times for such a primitive adventure, results in what I can only describe as a disappointing and boring game.

It's got some pretty pictures — if you don't mind waiting while they load.

SPELLBREAKER — ZORK VI INFOCOM Diskette \$28.95

In the beginning was ZORK I. Then, there came ZORK II, followed finally by ZORK III. Finally, that when, in the Stone Vase room of ZORK III, the entrance on the wall and IV and you were magically transported to a strange altar, surely that was a preview of ZORK IV? Well, yes and no. The next fantasy game from Infocom was called Enchanter. But sure enough, deep in the middle of the Castle was that very altar (where you died yet again!), and if you check the desk on the wall you will find the code Z4 on the corner of it.

Apparently the good people at Infocom discovered a long and hard before eventually deciding to move away from the name ZORK. They wanted to stress the fact that this was indeed a new series of adventures, with the protagonist cast as a Magic User rather than a Fighter. But the adventures continued to take

place in the same mythic realm, indeed the young mageport in Enchanter meets the adventurer from Zork I in his march Over, Plunder, and Profound Magic Items are everywhere. In Sorcerer (Zork V) you even find an encyclopedia and can read all about the history of the strange land, and you also reach the Western shore of the Great Underground Ocean. You wandered on the Eastern shores of it in Zork III. At the end of Sorcerer the game promised that the trilogy would be completed in the next two distant future.

Now, last year, that Infocom were releasing a new fantasy game called Spellbreaker created a great deal of excitement. But the word out to be a Beginner Level game — hardly a worthy successor to the previous five! It became clear when you check the code on the diskette label — ZP And, as an introduction to the series, an excellent game.

Finally, this year last year if you have an ST or a friend an Asterix, Spellbreaker appeared. It was well worth the wait. Enchanter is dated as Standard, Sorcerer as Advanced, and Spellbreaker as Expert. Unless you are a real masochist it is probably worth playing some of the earlier adventures first, but if you wish to go you can start with Spellbreaker. You don't need to have played the others first, but you will get more fun out of the references to people like your old games, Bellon, if you have them. And, Spellbreaker does tend to have less references to the rest of the series than most of the other games.

As far as the implementation is concerned, and I say more than that it is by Infocom? It understands English. It has so much text made it is the wrong word. It is extremely enjoyable to play. As the adventure starts you are in a rooming to discover what is going wrong with magic. The fact that everyone in the main village you are suddenly turned into a reptile tends to confirm your fears that things are not quite right? Choosing a shadow figure out of the Clashed Chalice you find yourself in the middle of your first problem — you are stuck on a shaft and need food of orange make. Once you solve that you will find your first small white cube. Until you discover the secret of the cube you are stuck on a very small area. Unlocking the secret of the cube will take you to a strange place which leads to even stranger place — a cave inhabited by a missing eye, an evanescent green staff safe, an invisible eye, and a giant snake. Enchanter thus progresses due to the fact that it is spellbreaking it's own self? You will also start finding new spells.

As in the previous two parts of the

trilogy, you can a spell book containing numerous spells, including old familiar ones like PRUTE for making light and YOGAN for manipulating, as well as new ones such as JINDAK to detect magic and LERONH to create a meal. You will need to supplement these with spells found on scrolls which, apart from the most powerful spells, can be GOMM-TEDE into your spell book and used over and over again.

If you succeed in making progress against any of the numerous problems which beset you, the one thing you are guaranteed about it that you will find more cubes? And they are all identical in appearance? The first couple you find you can keep track of, but as you get more and more you will find it impossible. Never find? There is not just one, but two, ways of keeping track between the cubes. And you will need to do so since there are no less than seventeen of them? (You don't, indeed can't, actually acquire all of them, but you don't really think I'm going to tell you how many YOU have to find do you?)

Each cube opens up new locations for you to explore. At first it all seems very daunting but you should eventually discover that things do actually run together a lot better than it first appears. The spells, wafers, incenses, detours, and puzzles are many and varied. Definitely not for the fastidious and perhaps a little less humorous than some of the previous episodes, but solving all the puzzles and finally defeating the shadow figure will be without doubt a joy for Zork-addicts and puzzle-lovers everywhere.

The author, Dave Lebling (make sure you read the alpha on the jacket as the Great' one!), co-authored the original masterpiece Zork (a strange and premature mixture of what we now know as Zork I and Zork II), as well as Zork I, II, III and Enchanter. He also wrote Sorcerer and Suspense.

Spellbreaker was well worth the wait. Now that Infocom has finished their second Fantasy Trilogy — what could hardly this one is, the end of the Great?



Spellbreaker is available on diskette and on the Atari ST and Amiga computers.

First Steps

by Mark Hutchinson

I would like to thank all the readers who have sent me the repaired horns and tips for beginners. Many tips have been the same, but it is gratifying to receive the response. Special thanks must go to Robert De Lener from Belgium for his mass of tips. I must again apologize to all of you who have patiently waited a reply to your letters while I was enjoying myself on a course in Scotland. I do apologise because it shows the same reader than PAGE 8. I hope I'll be able to get round to dealing with everything soon.

Following on from last issue there are a few more horns and tips.

XL HELP KEY: Many recovery maps give the locations for the control keys. Here is the location for the XL help key.

FEEL(TX) = 0 — No key pressed
FEEL(TX) = 27 — HELP key pressed
FEEL(TX) = 81 — SHIFT-HELP pressed
FEEL(TX) = 145 — CONTROL-HELP pressed

DOSE: The following is a list of DOSE horns mainly from Robert De Lener. Anyone using tape may wish to skip over this section.

To LIST your program in any text file without exiting DOSE
press C (RETURN)
type D filename.E (RETURN)

To get a personal directory listing from your disk
press A (RETURN)
type P (RETURN)

To refresh DOSE POKE 302,1 (RETURN)

To delete a binary file to an AUTORUN SYS from DOSE
press C (RETURN)
type filename.out,AUTORUN SYS A (RETURN)

Put up with having to type Y to a DOSE delete query? Add N to the filename and the deletion becomes automatic.

You can write text directly to a file when in DOSE by the following:

press C (RETURN)
type B,D filename

RETURN will end a line and CONTROL-J will end the file. Len Lerner should remember that one.

FOR TAPE USERS

In case the tape users feel left out, a few tips for them.

To save on memory, you can load up an introduction screen, show it for a few moments, then have it load on the main program automatically. To do this the file to be loaded must have been stored to tape using SAVE "C". The main program can be run by hitting the last line of the previous program as RUN "C".

The computer will look to see if the RETURN key has

been pressed, and will not read it in. To find the computer not loading that the RETURN key has been pressed you must use POKE 264,12 RETURN "C".

Sometimes, cheap tapes may save you money but they do deposit a lot of ferric dust onto the head. Make sure that you clean the head regularly. If you find it difficult to do so, open up the cassette door and look for a small lever at the back right hand side. Push this lever back out, at the same time, press PLAY and the head plates can be brought forward for easy access.

HOT PRINTER

Mr. J.E. Robinson informs me that, if you own a HP27 and Astrometa, that the following will produce the £ signs at the point where the symbol is to appear. Do not see space or punctuation.

CONTROL-O 23 CONTROL-O 23 CONTROL-O 1
CONTROL-O 27 CONTROL-O 24

A second way is to select Option 1 for printer choice then, at the start of the document, use CONTROL-O 27 CONTROL-O 23. What you wish the symbol to appear, type as CONTROL-O 8.

LEaving PROGRAM LINES

You may have noticed that some program lines are overly long and your computer will not accept these lines. To overcome this, POKE 50,0 to move the left hand margin two places to the left (i.e. the edge of the screen). Use observations, a list of which appeared in past editions of PAGE 8 issues 14-17.

HOT PRINTER

I have had a lot of responses about Post Shop and the HP27 printer. A letter from Mr. Pongrove informed me that the program will not support the printer. I can only suggest that the best way to persuade software writers that the HP27 is a viable printer in the UK is to write to the firm and complain bitterly. I know this sounds like hard work but it should be worth it. Most software writers in America and printers are comparatively poor. The HP27 has not made the same sales in, my, opinion because of its smaller print head, than very few HP27 printers always are written. However, if the demand is there then they will be written. Just for proof, my NEC 8025 was without control for some years ago but now it is one of the standards (often under a different name) in printer programs.

I will continue to include any other horns over the next few columns but, in yet, I have not decided what direction to follow for this column in the new year. Any ideas? As always please write to me at P.O. BOX 113, BELFAST, BT11 0TE (John's News. I included my Mark's address on the last one since The one is correct. My apologies.)

I hope that you all enjoy yourselves over the Christmas period and have a happy New Year. ■

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MAKE A PAGE 6 CONTRIBUTOR HAPPY

and

WIN YOUR CHOICE OF TWO BOOKS FROM THE PAGE 6 ACCESSORY SHOP (Three winners in all)

Readers who have been with us for some time will know that each year we have a readers poll in which you get a chance to show your appreciation to those Atari users who have contributed to past editions of Atari over the past year. For the 1990 Readers' Poll Awards we will present a handsome trophy to the contributor who receives the most votes in each of three categories. The categories are Articles, Programs and Miscellaneous and the contents of issues 19 to 24 are detailed below under their respective headings. You don't have to vote for one in each category, just pick out your three favourites in 1 to 3 order. The following list will help you decide but don't forget, of course, to refresh your memory from the actual issue.

You may see any entries for your issue, but pick your three favourites and enter them in 1 to 3 order. Maybe it's one you particularly remember, you might have thought it was well written, it might be something you have found particularly useful or which brought you something you did not know or solved a long standing problem. Maybe a review that persuaded you to go out and buy a well-deserved piece of software. Maybe a game that gave you hours of enjoyment. Whatever your wish, only make sure you vote, it is your chance to say thank you to fellow Atari owners who took the trouble to try and provide you with some CD/DVD enjoyment of your Atari!

Your vote will encourage our contributors to keep sending their progress, articles and reviews and will also help us to decide what should be in the magazine in the future. What's more, if you also fill in the short Survey you could also win some of these books!



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Readers Poll 1986

GAMES ... PROGRAMS

OR FUN

a whole

WINTER GAMES

Epyx Computer Software
\$4.95

Reviewed by
John Davison Jnr

Winter Games is a simulation of Winter Olympic Games (it is the only to date highly popular "Olympic" Game which can be found on ATARI 8-bit series). There are seven events to play: Ski Jump, Biathlon, Speed Skating, Figure Skating, Ice Jump, Free Style Skating and finally Bobsled. Every single event in the Games has its own theme music which plays while the event is taking. There are all reasonably good and snazzy, on the way, the 8-bit event.

When the game first loads, a colorful animated title screen leads into the opening sequence, complete with the lighting of the flame and the fly over by some highly detailed jets. You are then put on the main menu screen, where you select to either compete in all the events, compete in some events, compete in one event, preview an event, see the world records, watch the opening ceremony (again) or leave Winter Games. If participating in all events you can select your country out of a choice of 16. It seems a pity that the rest of Winter Games on the 8-bit series.

To give you an idea of what to expect, let me take you through the events:

Ski Jump Awards is a demonstration sport, you have to perform standard stunts on lines of a panel of judges. Moves you can perform include, Back and Forward Flips, Wide Kicks, Duffs, Back Scissors, and Stems. The graphics in this event are fantastic. The background is just like an oil painting, with highly detailed pictures of mountains and trees. The animation is very, very slick. Biathlon is a combination of cross country skiing and target shooting. It

SNOWBALL by Paul Day (June 27)
THE OCEAN by Nigel Linden (June 14)
MAZEFLE by Chris Davis (June 29)
FACTOR 18 by Geoff Thompson (June 17)
BLACK BRASSIER by David White (June 20)
CRAPSHOTS by Alan Moore (June 28)
COLOUR PALETTE by Barry Francis (June 28)
TELECAST by Paul Day (June 28)
CHAOS ATTRIBUTES by Paul Day (June 28)
NO MESSAGES by Joe Peley (June 28)
MEANS TO MEAN by Dave Reid and Steve Banks (June 28)
REMEMBER by Paul Day (June 27)
QUICK ASSEMBLER by Steve White (June 27)
TRAIN CRASH by Chris Fuller (June 27)
WHEELBY by Steve White (June 27)
SCALMASTER by Peter Wright (June 27)
SPINSTER by Chris Danks (June 27)
WALTSKIERS by Ken Day (June 27)

TRUCK CLUBS by Peter and Stephen Gibson (June 25)
HERNANDEZ by Paul Day (June 27)
SEED by Brian Swift (June 27)
SUPERCLAY by Michael Kemper (June 27)
VERMONT by Derrick Cooke (June 27)
WATER AND SCHOOL by Steve Ford (June 25)
WINDSURFER by Steve Pender (June 27)

ALTOGETHER 4.0 by Peter Francis (June 26)
SPEED CHECK by Gerry Francis (June 26)
FLYING MEN by Alan Moore (June 27)
MEIN by Alan Moore (June 26)
WINDSURF by Paul Day (June 26)

ARTICLES

DISPLAY LISTS by Steve Pender (June 19, 20)
STARS SPREADS by Kevin Griffin (June 19)
FIRST STEPS by Mark Macdonald (various times)
MARY FRANCES
ADVENTURE COLLIER (various times)
A GUIDE TO BUBBLE CHECK by Steve Pender (June 21, 22)
FROM THE RESPONSIBLE by Paul Day (June 21)
SHOPIVING by Gary Paul Day (June 21)
MEASURING TEMPERATURE by P. Burrows (June 21)
FRACTALS by Peter Cooke (June 22)
TIPS FOR PROBLEMS by Derrick Cooke (June 22)
GOING ONLINE by John S. Davison (June 22, 24)

MISCELLANEOUS

ASSEMBLER FOR THE AT by Mark Day (June 19)
BOOKS by John S. Davison (various times)
JOHN SWEENEY'S ADVENTURE REVIEWS (various times)
ATTARNS UTILITIES by Andrew Butler (June 19)

A LOOK AT TWO CITIES by Matthew Jones (June 26)
PRINTING REVIEWS by Alan Colledge (June 26)
GRAPHICS ART DEPARTMENT by Alan Colledge (June 26)
LATITICE by Matthew Jones (June 26)

JUST LIKE THE REAL THING by John S. Davison (June 27)
FLY EVEN FURTHER by John S. Davison (June 27)
TIME BANGS REVIEW by Mark Day (June 27)
PRO FOOTBALL by Matthew Jones (June 27)
TECHNICAL DREAM by Alan Colledge (June 27)
INDIVIDUAL REVIEWS by Mark Macdonald (June 27)
MEIN by Alan Moore (June 28)
A BRASSIER SCREEN by Dave Reid (June 28)
A 1: DELTA FOR YOU by Steve Banks (June 28)
PRO PARCEL by Mark Day and Alan Moore (June 28)
MONTECARLO by John S. Davison (June 28)
CUT & PASTE by John S. Davison (June 28)
MAKING MOVIES by Alan Colledge (June 28)
MAKING MOVIES by John S. Davison (June 28)
ULTIMA IV by John S. Davison (June 28)
ORANGE MAGIC by Chris Day (June 28)
HANDY REVIEW by Derrick Cooke (June 28)
SOFTWARE BANK by Stephen Poulton (June 28)
CARTHEDES by Matthew Jones (June 28)
S-BUBBLE by Matthew Jones (June 28)
PRINT SCREEN COMPANION by Alan Colledge (June 28)

wasn't well executed. Ski Jump. Fantastic graphics on this event and a really dramatic race to get you going. The animation is also very good and the background graphics are (yet again) superb. Not a line to really say about this one as it is straightforward and game to play. Free Skating. This event uses the same graphics and animations as the Figure Skating. The difference is that you have two minutes to perform your own routine, and you don't have to do each move just once (you can't do it more than three or four times though). The music



Pendron was one of the first computers to release any games on the ST with Mission: Moscow which ran on mono only. I never saw a detailed copy but what I did see only really came into the 'slight' category. Nothing else seemed to happen for a year and that's, incidentally, at the PCW show in 1986. Pendron kept out with you less than on ST games all in a glowing color and

continued overleaf

READERS SURVEY

67

How to be in with a chance of winning two Atari books of your choice.

Please take a few minutes to fill in and return the attached, quick and easy, survey card to join in the readers poll. If you have only just started reading the magazine please first complete the survey section.

With the two different Atari magazines it is important for us to identify our readers needs more closely and your feedback will be invaluable in deciding how we plan the magazine in the coming year.

We have included a section for you to indicate what you would like to see in the coming year. We have a couple of our best (but waiting to be researched and written) what you want, they just need the idea! It is sometimes difficult to judge what users want so it is quite easy to think that a particular area has been covered elsewhere when in fact many people may not have seen other articles. Tell us what you want to read and we will try our best to bring it to you.

Return the card by 11th January and you could be one of three lucky people to get the choice of any two Atari books from the PAGE 6 necessary. They A draw will be made on 1st February from all the cards received and the winners will be notified as soon as possible thereafter.

Come on then, make our games work for *you*!

Name *John Harber*
Address *35 MINDERMATA ROAD
LONDON
SE22 8NH*

READERS POLL

My vote for this best 3 items from issues 18 to 24 is

1
2
3

BASIC resolution only

ON SCREEN DISPLAY OF OBJECTS
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BY 0
4g, August 1984 0
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with resolutions above 640:

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